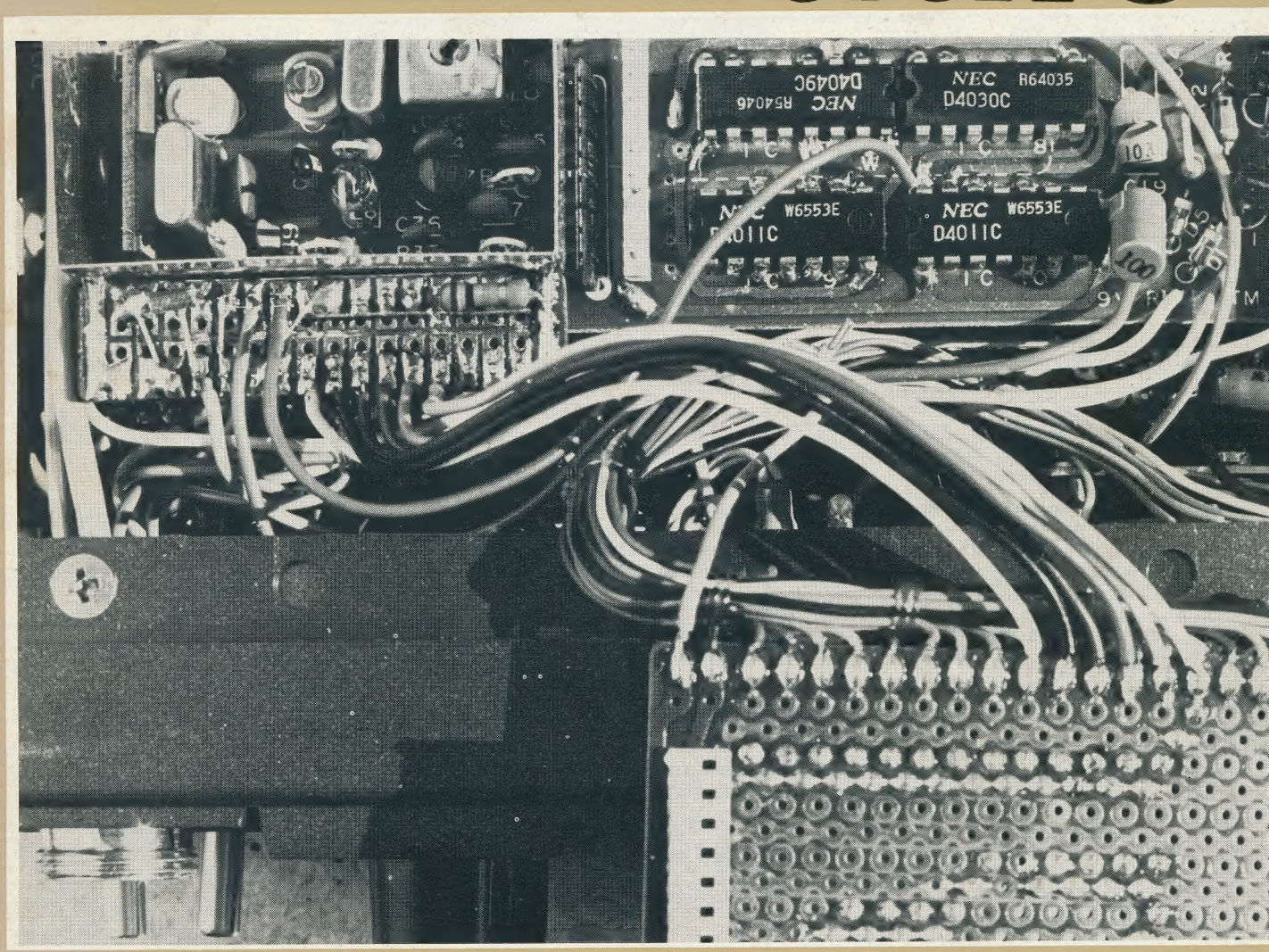
amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 46, No. 10 OCTOBER 1978

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COVER PHOTO

Interior of the ICOM IC22S showing part of the modifications by VK3YFO — see article "An Auto Simplexer for the IC22S" on page 10.

Registered for posting as a Publication — Category "B".

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PMG approved.

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This is an in-line and SWR meter for ham radio and CB radio. This power meter indicates the output power of your transmitter and SWR meter reads the ratio of travelling power to your antenna and reflected back from antenna. Compact and inclined front design meet any radio operation desk.

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30 Watts (rms); 50 Watts Maximum; 4 Ohms; Size: 184H x 111W x 114D m/m; Deluxe Push Speaker Terminals; Weight Approx. 2.27 kg each; Freq. Range 60-21,000 Hz.

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The Model TE-15 Transistorised Grid Dip Meter is a very accurate instrument operating from a 9 volt battery power supply. Six plug-in coils are supplied with each unit, covering the frequency range of 360 kHz to 240 MHz.
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Postage $2.40

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amateur radio

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Advertising: Material should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **25th of the second month preceding publication. Phone: (03) 24 8652.**—Hamads should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **3rd of the month preceding publication.**

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QSP — INTRUDER WATCH:

We have the guns, give us the ammunition

There are some vociferous amateurs who go about claiming the Institute's handling of various questions lacks fire and brimstone.

Without getting involved in side issues, what have they done when the Institute needed assistance?

Let me quote one example: The Intruder Watch.

Much more publicity than usual has been given to intruder watch this year, both in AR and on the Federal broadcast tapes. Many more reports are required from members if the Institute's voice is to become effective. Intruder watching is a sideline anyone can help with — licensed amateur and short wave listener alike.

POOR RESPONSE

What has been the response? According to the Federal Intruder Watch Co-ordinator, Alf Chandler VK3LC, the response has been negligible. In fact, the response could be counted as negative because amateurs say nothing seemed to have been done about "the woodpecker" in particular, so why waste time on intruder watching.

I can tell you this. The combined diplomatic and other approaches to the Russian authorities by the Governments of the U.S.A., United Kingdom and others have not resulted in the removal of "the woodpecker". However, "the woodpecker" is not the only intruder problem.

Alf sends into the P. & T. Department reports of intruders logged on the amateur bands. The reports have to include details of the quantity of loggings.

MANY MORE REPORTS ESSENTIAL

Unless the Department can point to more than a handful of loggings they are disinclined to take any action. This has been the state of affairs for years. So Alf is compelled to search for other avenues for redress. One of these is action through Intruder Watch Co-ordinators in other countries. If they also can detect and report the intruder they can sometimes get their own Administrations to take action. Several examples of this are on record.

The trouble is that an intruder causing chaos to amateurs in Australia may or may not be audible overseas. Our Administration will not take action on merely a few reports. Unless they have enough complaints to make a report to the IFRB of the ITU the intruder may get itself registered in the absence of a report of harmful interference. It then becomes "legitimate" and cannot be removed.

For example, why do you think there are so many broadcasting stations wielding muscle between 7.0 to 7.1 MHz — **a world-wide exclusive amateur band.** Oh yes, this will be taken up very strongly at WARC79, but where is the ammunition?

GUNS ARE USELESS WITHOUT AMMO

We have the guns but no ammunition. Each amateur should be busy making bullets to fire — namely, constantly reporting details of intruders to the Intruder Watch. The Intruder Watch has the strong support of the Institute.

Will you help with ammunition? Give us plenty and we'll keep firing the guns. Adequate fire power is essential.

D. A. WARDLAW VK3ADW
Federal President. ■

GOVERNMENT ANNOUNCES ETHNIC T.V. TO COMMENCE 1979 ON U.H.F. — DETAILS NEXT ISSUE

QSP

RTTY GROUP NSW DIVISION

From AREWISE, Vol. 1, No. 5, the official magazine of the NSW Division RTTY Group, comes news that the AGM of the Group was held on 2nd June at the WIC in Crows Nest. Peter Mulligan VK2ABH was appointed chairman for the ensuing year with Bob Taylor VK2AOE as Secretary, and Syd Molen VK2SG as Publicity and Broadcast Officer. Discussions were held on the proposed new Constitution and the proposal to go national. The Group aim to gain RTTY privileges for Novices and included a questionnaire soliciting signatures to support this move.

432 MHz INTERFERENCE

The RSGB reports in Radio Communication August 1978 432 MHz interference centred on 432.5 MHz ±3 MHz from a new radiolocation system. This system, called Syledis, is reported to be used by BP-Shell and the RSGB have protested about its use within the amateur band. ■

APOLOGIES TO ADVERTISER

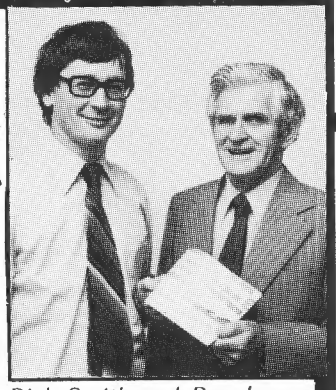
In the advertisement for Emona Electronics in the centre pages of August and September issues of AR, our printer inadvertently reversed the prices for the Dentron MLA-2500 Linear Amplifier and the Dentron MT-2000A Antenna Tuner.

The MLA-2500 Linear Amplifier should have carried the price of $1300 and the MT-2000A Antenna Tuner should have been $269.50.

We apologise to Emona Electronics for the inconvenience caused and also to many of our readers who must have thought that Father Christmas really did exist. ■

THE WINNER

OF THE DICK SMITH/ YAESU 'WIN A TRIP FOR TWO TO TOKYO' CONTEST — Judged by Jim Rowe, Editor of Electronics Australia.



Dick Smith and Ray Jessup holding the winning entry.

Ray Jessup

Ray, VK2NVJ, bought a Yaesu FT-7 transceiver from our Gore Hill store in June. He uses it regularly to contact his son in New Zealand. Ray is currently studying for his full amateur license.

HERE IS THE WINNING ENTRY:

'Promote amateur radio as an antidote to current frustrations confronting youth . . . Parents: Your life is easier if your kids have a good hobby. Amateur radio is a rewarding and challenging hobby, leading to: Practical application of maths, english and logic . . . Self discipline . . . Responsible citizenship . . . New and worthy friendships . . . Job opportunities . . . '

THIS IS RAY'S TRIP OF A LIFETIME — Congratulations from Dick Smith Electronics and Yaesu!

WIRELESS INSTITUTE OF AUSTRALIA

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Executive Office: P.O. Box 150, Toorak, Vic., 3142. 2/517 Toorak Rd., Toorak, Ph. (03) 24 8652.

Divisional information (all broadcasts are on Sundays unless otherwise stated):

ACT:
President — Mr. E. W. Howell VK1TH
Secretary — Mr. Ted Radclyffe VK1TR
Broadcasts— 3570 kHz & 146.5 MHz: 10.00Z.

NSW:
President — Mr. D. S. Thompson VK2BDT
Secretary — Mr. T. I. Mills VK2ZTM
Broadcasts— 1825, 3595, 7146 kHz, 28.47, 52.1, 52.525, 144.1, Ch. 8 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and ch. 3 and 6).

VIC.:
President — Mr. E. J. Buggee VK3ZZN
Secretary — Mr. J. A. Adcock VK3ACA
Broadcasts— 1825, 3600, 7135 kHz — also on 6m, 2m SSB and 2m Ch. 2 repeater: 00.30Z.

QLD.:
President — Mr. A. J. Aarsse VK4QA
Secretary — Mr. W. L. Gielis VK4ABG
Broadcasts— 1825, 3580, 7146, 14342, 21175, 28400, kHz; 2m (Ch. 42, 48): 09.00 EST.

SA:
President — Mr. C. J. Hurst VK5HI
Secretary — Mr. C. M. Pearson VK5PE
Broadcasts— 1820, 3550, 7095, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.

WA:
President — Mr. L. A. Ball VK6AN
Secretary — Mr. P. Savage VK6NCP
Broadcasts— 3600, 7080, 14100, 14175 kHz, 52.656 and 2m (Ch. 2): 01.30Z.

TAS.:
President — Mr. I. Nicholls VK7ZZ
Secretary — Mr. M. Hennessy VK7MC
Broadcasts— 3570, 7130 kHz: 09.30 EST.

NT:
President — Dick Klose VK8ZDK
Vice-Pres. — Barry Burns VK8DI
Secretary — Graeme Challinor VK8GG
Broadcasts— Relay of VK5WI on 3.55 MHz and on 146.5 MHz at 2330Z. Slow morse transmission by VK8HA on 3.555 MHz at 1000Z almost every day.

Postal information:
VK1 — P.O. Box 46, Canberra, 2600.
VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs (10.00-14.00h).
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Sat 10.00-12.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — at West Thebarton Rd., Thebarton (P (08) 254 7442).
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1010, Launceston, 7250.
VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

Slow morse transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

VK QSL BUREAUX

The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 1173, Canberra, A.C.T. 2601.
VK2 — QSL Bureau, C/- Hunter Branch, P.O. Teralba, N.S.W. 2284.
VK3 — Inwards QSL Bureau, Mr. E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071.
VK3 — Outwards QSL Bureau, Mr. R. R. Prowse, 83 Brewer Road, Bentleigh, Vic. 3204.
VK4 — QSL Officer, G.P.O. Box 638, Brisbane, Qld., 4001.
VK5 — QSL Bureau, Mr. Geo. Luxon VK5RX, 203 Belair Road, Torrens Park, S.A. 5062.
VK6 — QSL Bureau, Mr. J. Rumble VK6RU, G.P.O. Box F319, Perth, W.A. 6001.
VK7 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7001.
VK8 — QSL Bureau, C/- VK8HA, P.O. Box 37317, Winnellie, N.T., 5789.
VK9, 0 — Federal QSL Bureau, 23 Landale Street, Box Hill, Vic. 3128.

VIC. WESTERN ZONE CONVENTION

at

BALLARAT

NOVEMBER 4th and 5th

Further details and bookings for Dinner to
VK3ZBS or VK3ZHH

QSP

NEW MEMBERS' SUBSCRIPTIONS

Please note, when you join the WIA you pay a full year's subscription.

This subscription is then split into two parts for accounting and membership purposes. One part is set aside as the pro rata amount owing for the balance of the calendar year to 31st December. The other part is the credit into the ensuing year. In December you will be sent a subscription notice for the full year subscription, 1st January to 31st December, less the credit brought forward from your first payment. After that you stay on the calendar year subscription ending 31st December. Subscription notices are printed early in each December from the computer file using the same address on file for the distribution of your December AR for that year.

When you join the WIA your subscription period begins with the month your first AR is despatched to you. Membership of the WIA is membership of the Division in which you reside and it is that Divisional Council which votes for acceptance of you as a member. Thus your application for membership could be at least a month or two in advance of your subscription membership because of processing at Divisional level and mailing the applications in batches to the Executive office where EDP processing occurs.

If your joining date is late in the calendar year, say October or November, you would carry forward quite a large credit into the following year and thus you would only owe quite a small amount in cash for the ensuing year's subscription. This is where we have a little problem with the present computer programme because the threshold level is quite small for amounts owing before the automatic AR address label cut-off comes into operation. Even though you might only owe say $2 or $3, the cut-off will occur unless it can be manually cancelled. Since, for economy reasons, the office staff is small in numbers and they are heavily engaged in processing outgoing notices and incoming payments at the turn of the year, there is not sufficient time to devote to going through the entire lists to extract details of those who owe only small amounts for the purpose of cancelling the automatic cut-off for these members.

The best way for every member to avoid AR being cut off is to pay promptly. If by some mischance you do not receive a subscripton notice before about mid-January do please send in right away what you think is the proper amount owing for the year ahead. It is much better this way than waiting a month or more to see if AR arrives or not. If you are unfinancial at the cut-off date there will be no computer label for you — it is quite automatic and impersonal.

Late payers of subscriptions always risk one or more of the missing ARs being out of print. Again, for economy reasons, it is necessary to restrict the number of "overs" (over-prints) of AR to a minimum.

STOP PRESS

AX7 PREFIX

Approval has been granted for Vk7 amateurs to use the "AX7" prefix from 1400 GMT 3.11.78 to 1400 GMT 5.11.78 incl. to commemorate the 175th anniversary of Lt. John Bowen's (R.N.) landing at Risdon Cove in 1803.

Official station AX7 WI will operate from the Tasmanian Hobart Radio Convention on Nov. 3-Nov. 5.

Commemorative QSL's will be used for all AX7 contacts.

WIANEWS

POSTAL AND TELECOMMUNICATIONS DEPARTMENT LETTERS

Two letters from the Department during August. The first concerns candidates for the Novice examination who live in remote areas and is referenced RB4/11/30 of 31-7-1978. This is the text of that letter —

"In appreciation of the geographical problems facing prospective novice candidates living in remote areas the Department has decided to implement the following procedures.

Special Examinations:
Examinations in addition to the normal scheduled dates may now be conducted in Capital Cities and Regional Offices of the District Radio Inspector for candidates who reside more than 80 kilometres from the nearest office of the Department.

Conduct of Examinations:
Radio inspectors may conduct examinations in remote country areas during routine visits to that area. This will allow some candidates who otherwise could have difficulty in attending the main centres to avail themselves of this facility. It is important to note, however, that a request for an examination should not serve to initiate a special examination itinerary.

It is important to note that the number of candidates should be sufficient to make the examination economically viable."

This is a subject which the Institute has been pressing the Department for a satisfactory solution for a long time. In fact the WIA's submission about Novice exams actually went much further than this — please see AR for September 1977, pages 20 and 21.

At a meeting of the Joint WIA/Departmental Committee on 22nd August clarification was sought concerning the number of candidates to make an exam worthwhile in a distant centre. A figure of about ten guaranteed candidates was mentioned but this depended upon circumstances as, for example, an RI visiting the centre anyway in the course of other duties.

HOW TO SET ABOUT GETTING AN EXAM IN A REMOTE CENTRE
The way to go about getting a Novice exam in your town is for the group leader or instructor to write to the State Superintendent giving details of all the candidates and, most importantly, suggesting some local hall or classroom which he has previously ascertained would be made available for the exam.

The second letter from the Department was in reply to a WIA request resulting from a decision made at the WIA 1978 Federal Convention. The details are now well known but members would like to know how it read. This letter was also referenced RB4/11/30, and was received on 8th August, having been posted on the 7th. The letter is published in full in "Novice Notes" under WIA correspondence.

On the same day is was received, advice was telephoned to Federal Councillors and many Novices were quick to spread out up to 3625 kHz. The news arrived in time for the RD Contest and it will be interesting to see how many Novices participated in it.

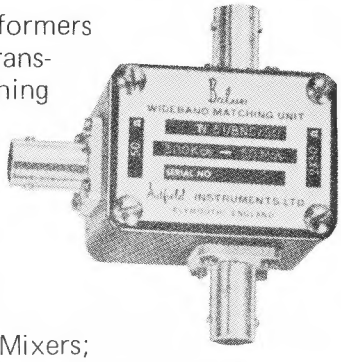
JOINT COMMITTEE
At the August meeting most of the time was occupied in discussing the examinations and licensing areas. Graeme Scott, the Federal Education Co-ordinator, presented to the Department the bank of multi-choice Novice questions prepared by his WIA helpers. This bank consisted of over 600 questions from which a paper of 50 typical questions is to be selected for inclusion in the proposed printed edition of the WIA Novice syllabus and study guide.

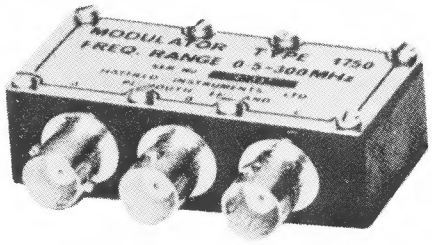
THE AOCP SYLLABUS
After some discussion it became apparent that work on the official AOCP syllabus has not yet been completed. If it is ready in time the Departmental representatives believed it should be

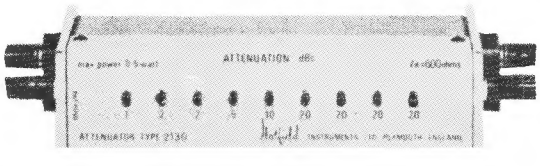
SCALAR

for Hatfield Instruments

High Power H.F. Transformers Wide Band Matching Transformers; Antenna Matching Units; High Power Matching Units; Hand-Held Decibel Meter; VHF Signal Dividers; Coaxial Switches; Coaxial Relays; R.F. Bridge; Modulators; Screened Mixers; Psophometer; Low frequency Modulators; Hybrid Units – Passive Couplers; Aerial Matching Units; Three and Five Port Wideband Units; Universal Milliwatt Test Set; Double Balanced Mixers; Subminiature Double Balanced Mixers; Low Frequency Double Balanced Mixers; Decade Resistance Boxes; Decade Capacitance Box; Programmable Attenuator Units; Balanced Attenuators; VHF Variable Attenuator; Level Measuring Set; Radio Frequency Attenuators; Level Measuring Sets; Passive Power Dividers; Switched RF Attenuators.







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possible for the August 1979 AOCP theory exam to be of the multi-choice variety. Consequently the next AOCP exam in February would be the traditional essay type. Once again the WIA, through the Federal Education Co-ordinator, would arrange the preparation of a bank of suitable questions for presentation to the Department.

EXEMPTIONS FROM THEORY EXAMS

What were the criteria, asked the WIA representatives, for exempting certain people from having to sit for the theory exam? The Department did not grant automatic exemption, but in each case examined the syllabus which was used for the qualifications claimed by any candidate. It had been found in the past that, although the candidate's qualifications appeared to far exceed the AOCP standard, nevertheless a number of specific subjects had not been studied — e.g. harmonic generation and interference from transmitters.

The Departmental officers enquired about comments received on the last Novice exam. Feedback from candidates indicated the standard was quite reasonable but that much dissatisfaction was expressed about the long delays in obtaining a licence by those who passed.

LICENSING DELAYS

The delays in issuing licences was noted as particularly irksome in Victoria although this was not the only State affected. The documentation involved with licensing was generally considered to be antiquated. The WIA will continue to exert pressure to have licensing delays reduced to a minimum.

RECIPROCAL LICENSING

A WIA enquiry elicited the fact that reciprocity existed only with those countries listed in a letter from the Department printed on page 17 of AR for August 1972.

The WIA representatives, consisting of the Federal President, David Wardlaw, Peter Wolfenden and Graeme Scott re-raised a number of items many of which have been in the system for some time. One matter which at long last appears to be nearing a conclusion is the WIA request some years ago for reduced licence fees for pensioners and disabled amateurs, see AR December 1976, page 5.

FINAL ANSWER EXPECTED
IN 3 or 4 MONTHS

SUBSCRIPTIONS 1979

At the Executive meeting in August much time was spent closely examining the financial situation in order to relate this to a budget for 1979.

THE FEDERAL COMPONENT OF WIA SUBSCRIPTIONS HAS NOW REMAINED UNCHANGED SINCE 1976. In effect this really means that there has been a continuous REDUCTION in Federal dues when related to inflation.

INFLATION CAUSES REDUCTION
IN FEDERAL DUES

Next year is the big year for expenses related to WARC 79. The WARC levy last year helped towards the funds accumulated for this purpose but an appeal is shortly to be made for NON-members of the Institute to make some contribution.

Apart from this, costs of AR have risen sharply, especially in postages, and other office expenses are increasing.

Nevertheless, after a long discussion, the Executive decided to recommend to the Finance Sub-Committee that there should be no change in the Federal dues for 1979. The total amount should remain at $15.00. At the time of writing it is not known if the WIA's financial experts will accept this. They might deem it prudent to recommend some increase to avoid eating into reserves. IT WAS EMPHASISED THAT HOLDING THE FEDERAL DUES AT THE 1978 LEVEL DEPENDED LARGELY UPON A CONTINUED UPSURGE IN MEMBERSHIP.

At the same time a short discusion ensued on the kind of subscription notice to be printed for 1979 onwards and on balance it was decided NOT to have one with a counterfoil.

PROJECT ASERT

Also during August, the VHFAC discussed at great length the PROJECT ASERT, briefly outlined on page 48 of last month's AR. Dr. McCracken attended the meeting and explained his proposals in detail. It was agreed however that some preliminary caution should be exercised and consequently a small pilot committee will set the thing in motion. The pilot committee consists of Bob Arnold VK3ZBB as chairman, Dr. McCracken (VK2CAX) himself as scientific advisor, and Les Janes VK3BKF as hardware co-ordinator.

TV CHANNEL 5A

Yet again the prospect of increasing usage of TV Channel 5A occupied the time of the Executive and the VHFAC. Peter Wolfenden prepared and recorded three segments of the Federal tapes broadcast during August. Further technical information was awaited so as to prepare a proper submission to the Minister and to include a very strong recommendation that UHF television should be the goal rather than the proliferation of non-standard channels such as 5A and 0.

Various other items of interest in the pipeline will have to be left over until next month.

NEXT NOVICE EXAM

Clarification was finally obtained from the Department about the date of the next Novice examination — this will be 21st Novembe for all States EXCEPT VICTORIA, which will be on Saturday, 25th November. ■

QSP

JOTA

A reminder about Jamboree on the Air, the 21st. Begins about 0.001h local time on 21st October and ends 48 hours later. If you can help out by providing and manning a station for a Scout or Guide group contact your local Scout JOTA organiser right away. Here is an excellent opportunity to show your amateur radio prowess — Novices, Limiteds and Full Calls can all participate. The Australian Radio Scout net will operate on 1st and 2nd Sundays in September and the 1st Sunday in October — listen on 7070 kHz from 09.30h for VK4QH which might later QSY to 14290 kHz. Perhaps next year a special Scout Novices' net might be organised on frequencies available to the Novice amateur operator.

IT IS NOT TOO LATE TO
JOIN WITH SCOUTS AND GUIDES
IN JOTA 1978.

The opening JOTA ceremony will be on air from VK1BP at 14.00h EAST on Saturday, 21st October, which will include greetings from the Chief Scout, Sir Zelman Cowen, the World JOTA organiser and Les Mitchell, the founder of JOTA. The frequencies will be close to 7090 kHz and 14290 kHz, the official World Scout frequencies. The World Bureau JOTA will be on air as HB9S/portable from near Geneva and should hopefully be on the 21 and 28 MHz bands so that Novices can have a chance to work this station.

ARTICLES FOR AR

We are always on the lookout for both technical and general articles for publication.

Please forward your submissions to the Editor, P.O. Box 2611W, GPO, Melbourne 3001.

In order to keep a reasonable balance of material published, it is sometimes necessary to hold submitted items for several months, therefore some delays can be expected before the item is actually published.

On receipt of an article, an acknowledgement is sent to the author advising receipt and approximate publication date — but circumstances at the time of finalising an issue may temporarily delay an article.

All items accepted will be published as soon as possible after receipt, and your indulgence is requested if publication has not occurred at the previously notified time.

Technical articles especially require editing by our technical staff and professional drafting of circuit diagrams — this does delay some material for a few months.

We would also request that should authors who submit items to AR and other Australian magazines simultaneously, as a matter of courtesy to all concerned, each magazine be advised that the item has been submitted elsewhere to save embarrassing duplications as have occurred in recent months.

DECORATIONS

Advice has been received that Surgeon Rear-Admiral Jim Lloyd VK1CDR was awarded the Officer of the Order of Australia in the Queen's Birthday list. Also honoured was Jim Wilkinson, awarded the Imperial Service Order. ■

MICROCOMPUTERS

An insert advertisement in the July 1978 edition of Monitor (the Proceedings of the IREE, Australia) advises that a publication entitled "Microsystems" is published in alternate months in Sydney and costs $30 for one year. Incidentally, the same issue of Monitor lists Lawrie Blagbrough VK4ZGL as the Chairman of the IREE Brisbane Division. ■

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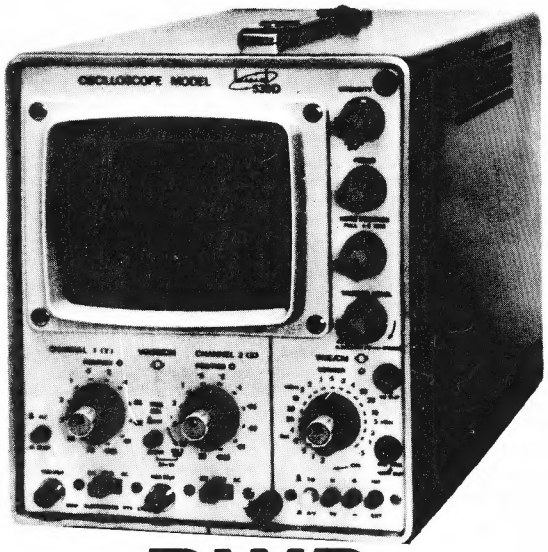

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The IC22S is an excellent mobile rig, but I am sure every owner has been frustrated by forgetting to switch to simplex when necessary, after changing channels. After the modification (need I say it), you will wonder how you got along without it.

The additional circuitry, costing less than $1, is mounted on a small piece of Vero board. The only change in existing wiring is the re-location of one wire. There is provision for nine simplex channels, although this can be expanded by adding extra diodes. After modification, the DUP/SIM switch is disabled when switched to simplex channels and simplex operation is automatically selected. Repeater channel operation is unaffected.

Referring to the modified circuit (NOTE: the new IC is designated IC11), when a repeater channel is selected all anode ends of the diode OR gate are floating (i.e. not connected to +9V), therefore pins 1 and 2 of IC11 are pulled LO by the 10k resistor. By inversion, pins 3 and 12 go HI. Therefore the logic signals from the DUP/SIM switch are inverted twice and appear at the dp point on the programming matrix board with no change. When a simplex channel is selected, +9V from the channel switch turns on the appropriate diode in the OR gate. This pulls pins 1 and 2 HI and therefore pins 3 and 12 LO, this blocks logic from the DUP/SIM switch and forces pin 11 HI, therefore pins 4 and 10 LO. Now that the dp point is LO for both Tx and Rx, simplex operation is assured. The two output gates are in parallel to properly drive the 10k pull-down resistor on the PLL board.

Cut a piece of Vero board 18 strips by 4 holes, EVERY strip should have 4 holes. Cut the inner 16 strips to form pads for the IC and diode leads, file a bevel on the ends of the strips (to prevent shorts to the oscillator shield). Make the mounting lugs by tying the end strips to the board with wire, this prevents the copper from lifting when soldered (see Fig. 3). Mount the IC and diodes (see Fig. 2 for orientation) on the "component" side of the board, on the other side mount the resistor and links as in Fig. 2. Unsolder the red wire from the dp point on the programming matrix board and solder it to pin 13 of IC11, run a wire from pin 4 of IC11 to the dp point. Run the supply wire from pin 14 of IC10 to pin 14 of IC11 (see photo). Solder the end strips to the oscillator shield with the board about 5mm below the top edge of the shield, check for accidental shorts.

To set up, connect each input of the diode OR gate to a simplex position on the programming matrix board, at the points where the wires run to the channel switch. Unused OR gate inputs are left open. Example, in the original IC22S programming connections, wires should be run from 3 diodes to positions 9, 10 and 11 for channels 40, 50 and 51.

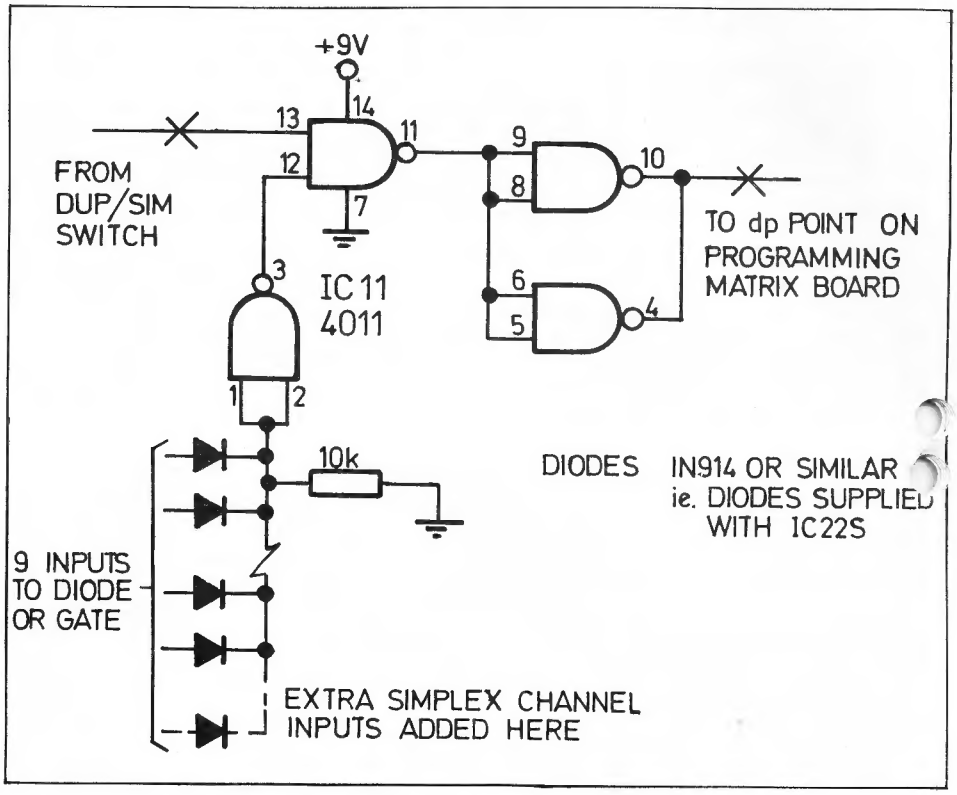

+9V
FROM DUP/SIM SWITCH
IC 11 4011
TO dp POINT ON PROGRAMMING MATRIX BOARD
10k
DIODES IN914 OR SIMILAR ie. DIODES SUPPLIED WITH IC22S
9 INPUTS TO DIODE OR GATE
EXTRA SIMPLEX CHANNEL INPUTS ADDED HERE

Figure 1

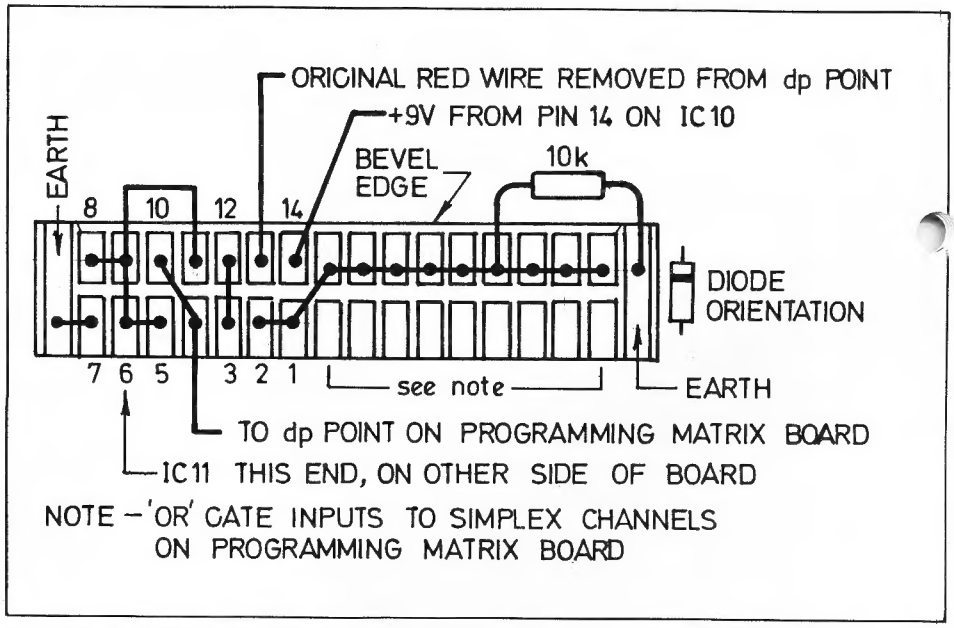

ORIGINAL RED WIRE REMOVED FROM dp POINT
+9V FROM PIN 14 ON IC10
BEVEL EDGE
10k
EARTH
DIODE ORIENTATION
see note
EARTH
TO dp POINT ON PROGRAMMING MATRIX BOARD
IC11 THIS END, ON OTHER SIDE OF BOARD
NOTE – 'OR' GATE INPUTS TO SIMPLEX CHANNELS ON PROGRAMMING MATRIX BOARD

Figure 2

My thanks to Arthur Hill for his help with the photography.

POSTSCRIPT

Since writing this article, it was found necessary to add a resistor from Pin 13 of IC11 to earth. This ensures proper operation when working simplex on repeater input frequencies, using the DUP/SIM switch simplex position. ■

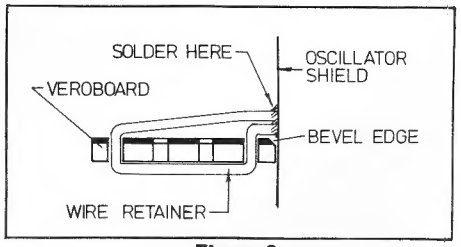


Figure 3

GETTING THE BEST OUT OF YOUR SSB

Denzil Roden VK2BXF
7/169 Herring Road, North Ryde 2113

A casual tune around the amateur bands will bring to light all kinds of signals purporting to be SSB voice transmissions. Lots are from home-brewed gear but many of them emanate from commercially produced equipment. It is evident that many amateurs are not getting the best results from their stations.

The most common source of trouble is the incorrect alignment of the carrier insertion oscillator frequency with respect to the sideband filter. This has been found to be a fault even with brand new commercially made amateur equipment, so a check of the positioning of the oscillator frequency is well worthwhile initially, and again after a couple of years operation.

Natural ageing of crystals used in the carrier oscillator and in lattice filters can itself cause misalignment to occur. Ageing is the process of the settling down of the atomic structure of the quartz, after this has been disturbed through cutting, grinding, etching and plating, etc., in much the same way as time has to be allowed for relaxation of winding tensions in copper wire and plastic bobbins, before maximum inductance stability may be obtained with precision pot core coils.

A new crystal can be expected to shift in frequency by up to 500 Hz or, in some cases, with cheaply produced crystals, by as much as 1000 Hz, in the first year or of manufacture.

Some of the more professional manufacturers pre-age the crystals they use. Ageing can be accelerated by placing the crystals in switched oscillators and temperature cycled ovens. However, when one considers the vast numbers of crystals in new equipment every year, it is obvious the process is very costly in time and space, so crystals supplied in new equipment are unlikely to be aged.

Government disposals crystals, such as the FT243 style, have been lying around for a great many years and are very useful as they are fully aged. Even so, where slight changes in their frequencies are made, new ageing problems may be introduced.

FILTER RESPONSE

The carrier oscillator frequency, generally, is positioned about 20 dB down the skirt of the filter, though it does depend upon the filter shape. Some filters are symmetrical while in others the skirt is steeper on one side, giving greater rejection of the carrier oscillator frequency.

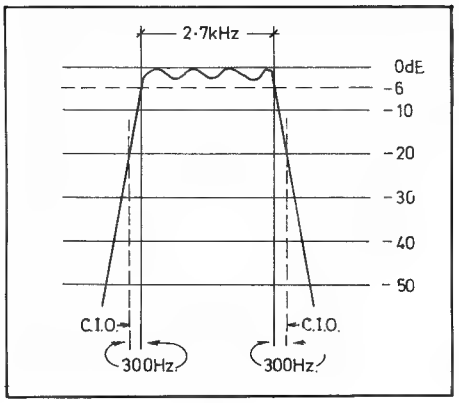


FIGURE 1

The 20 dB point can be taken to correspond to 300 Hz outside the point of 6 dB attenuation. So, in Fig. 1, the filter will accept frequencies between 300 and 2700 Hz above or below the CIO frequency for USB and LSB respectively.

Considering a USB exciter, the transmission will contain frequency components corresponding to voice frequencies in the range 300 to 2700 Hz.

Were the CIO misplaced, 500 Hz low, the voice range would be restricted to between 800 and 3200 Hz. This would have the effect of eliminating a great deal of the basic components of intelligibility of the speech. This results in the transmission being extremely difficult to tune at the distant receiver and causes the transmission to suffer more from propagation and interference problems. Though it may still be possible to distinguish what is said, the speech sounds thin and unnatural.

With the crystal frequency placed too high, the top end of the voice range is restricted, giving a woolly or muffled sound, lacking in clarity and again making the receiver tuning tricky.

Due either to uncertainty or politeness, one will find that only about one of every ten average amateurs will report such a transmission defect without prompting. The answer is for you to check your own gear for yourself.

ADJUSTMENT TECHNIQUES

There are various ways in which CIO alignment may be checked. These are described in greater detail in the various handbooks, but the method employed is decided by the availability of test equipment. I shall outline various approaches to the problem which I hope will prove helpful to those with limited access to equipment.

In the ideal situation where one has access to top notch test gear, the direct method of measuring the filter response can be used. A signal generator having a slow tuning rate is connected at the input to the IF strip, containing the SSB filter. An RF voltmeter is connected at the output of the IF amplifier following the filter. Then as the generator is carefully tuned across the filter passband, a plot may be made of output voltage against generator frequency, the frequency being measured accurately using a counter. A type BC221 frequency meter is useful as a calibrated generator for the purpose.

Thus the frequencies at which 6 dB attenuation occur can be established and hence the upper and/or lower CIO crystals may be set using the counter or BC221.

In this manner the response may be plotted of a filter not wired into an equipment, provided the filter is terminated with the correct impedance at input and output as specified in the filter data sheet. Later when the equipment is assembled, the information can be used to adjust the oscillators.

Alternatively, a receiver CIO may be aligned using an uncalibrated signal generator, tuned to any band — preferably an LF band as tuning becomes easier — connected to the receiver aerial terminal. Then as the generator is tuned across the receiver passband, the varying beat frequency between the signal and the CIO is measured at the receiver audio output, by means of a counter, or other more traditional methods of audio frequency measurement.

The audio output level can be metered, though AGO can alter linearity of readings. Otherwise the receiver "S" meter will give a close enough indication of 6 dB attenuation. The CIO trimmer can be adjusted directly to produce an audio output frequency range from 300 Hz to 2700 Hz between the —6 dB points of the receiver response.

TRANSMITTERS

Where a transmit-only unit is to be aligned, a frequency calibrated audio generator is fed into the microphone socket and with minimal drive to the PA, the RF output level can be measured at the aerial socket of the transmitter, using a VTVM power meter or even an SWR meter. Again, the input frequency range should be 300 Hz to 2700 Hz between the —6 dB points.

Without even an audio generator, a most basic, if rather crude method, is to

unbalance the balanced modulator and adjust the CIO crystal trimmer, measuring the change in transmitter output level as the CIO is tuned around the filter skirt. This, of course, is only possible where the trimmer capacity range is sufficient for adjustment from the top of the filter response down to just below the 20 dB point. One well known brand of transceiver I once set up, did not have enough trimming range to allow the upper and lower CIO crystals to be set to their correct frequencies. It was necessary to remove a fixed capacitor in parallel with the trimmer in one case and to add capacitance in the other. So do not rely too much on your kilobuck equipment designers!!

With transceivers, CIO misalignment is not always so obvious in the receive mode, so the Old Timer's adage that excellent reception is not proof of good transmission holds true again.

Just by listening around the bands, one will realise that SSB transmissions can result in really pleasant audio quality, and in a lot of cases can almost equal hi fi!

When you tire of trying to find a microphone that sounds right, just check the basics. Don't take anything for granted, especially if you have a rugged voice like mine — fortunately for you all, I'm a CW man! I hope this general information will help someone to achieve better two-way performance. ■

TRY THIS

WITH THE TECHNICAL EDITORS

A SIMPLE GUNNPLEXER 10 GHz LINK

Paul Jacobs W2IOG

Here is a simple Gunnplexer hook-up that WA2ZKD and W2IOG have been using for several months now. It has been very easy to use, and we have had a lot of fun "hilltopping" with them. I suggest you make one or both of your units portable, as the spots you have to get to for line of sight paths are not always accessible by road (even with 4-wheel drive).

Start your initial tune-up with the units only a few hundred feet apart. Set the varactor bias on the free running unit to about 4 volts. On the "AFCD" unit set S_1 to position 1 (manual) and S_1 to position 2 (tuning voltage). Tune the bias pot until you hear the converter noise quiet, and note the M_1 reading. If it reads between 2.5 to 5.5 volts, you can switch S_1 to the AFC position and you should be "locked". If not, adjust the GPX manual tuning until you can acquire signal in the 2.5 to 5.5 volt range. Then move the S_1 to "AFC" and lock the two units. Now switch S_2 to read AFC voltage and tweak the GPX manual tuning until M_1 reads exactly 4 volts. Now you should be "locked" at exactly centre tuning on your converter. If the FM receiver on the other end is now tuned to the same frequency as yours, you will have a two-way audio path.

If your units won't lock with the above procedure, it means you are tuned to the wrong side of carrier. Just tune the manual frequency adjust until you get another signal, and try again.

Once these adjustments are made, you need only set up at your "DX" location, aim your antenna, switch to manual and tune near 4 volts until you acquire signal. Then flip S_1 to AFC and your are in communication!

Good luck and good DX. ■

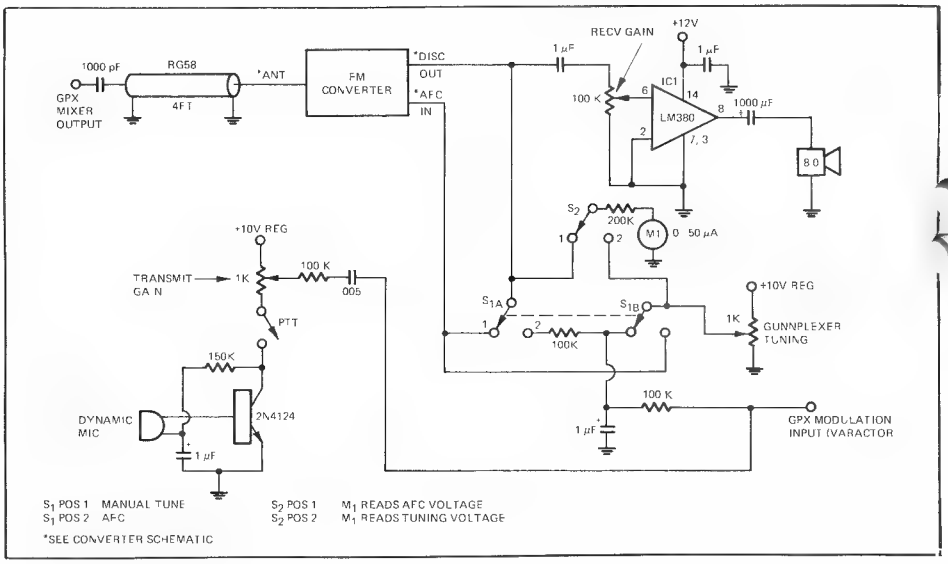


FIG. 1: Gunnplexer IF, Audio, AFC and Modulator (use one end of link only)

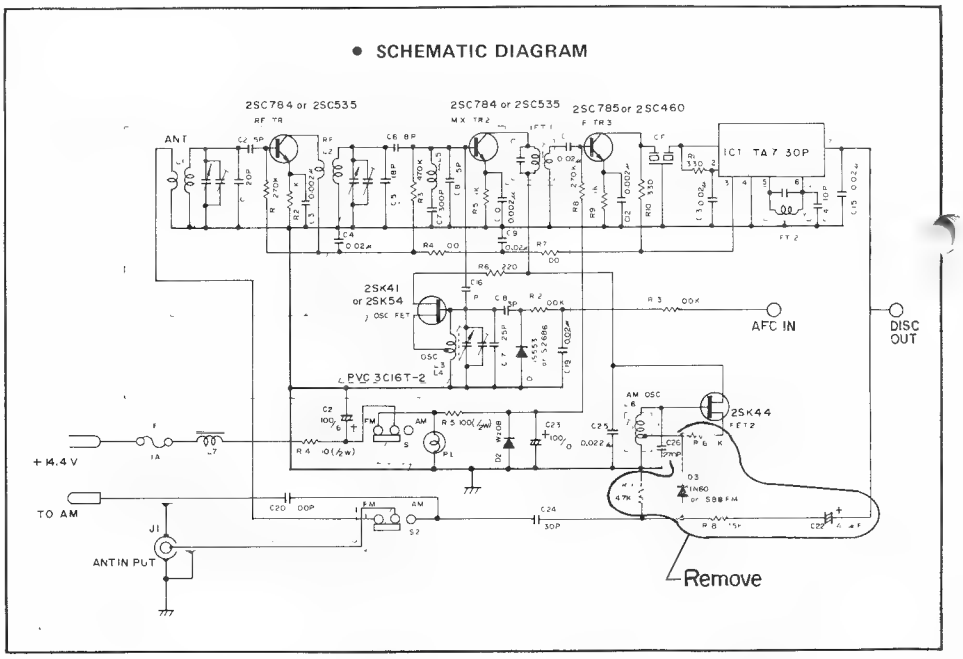


FIG. 4 (Above): Schematic Diagram

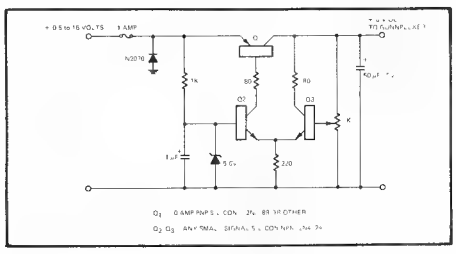
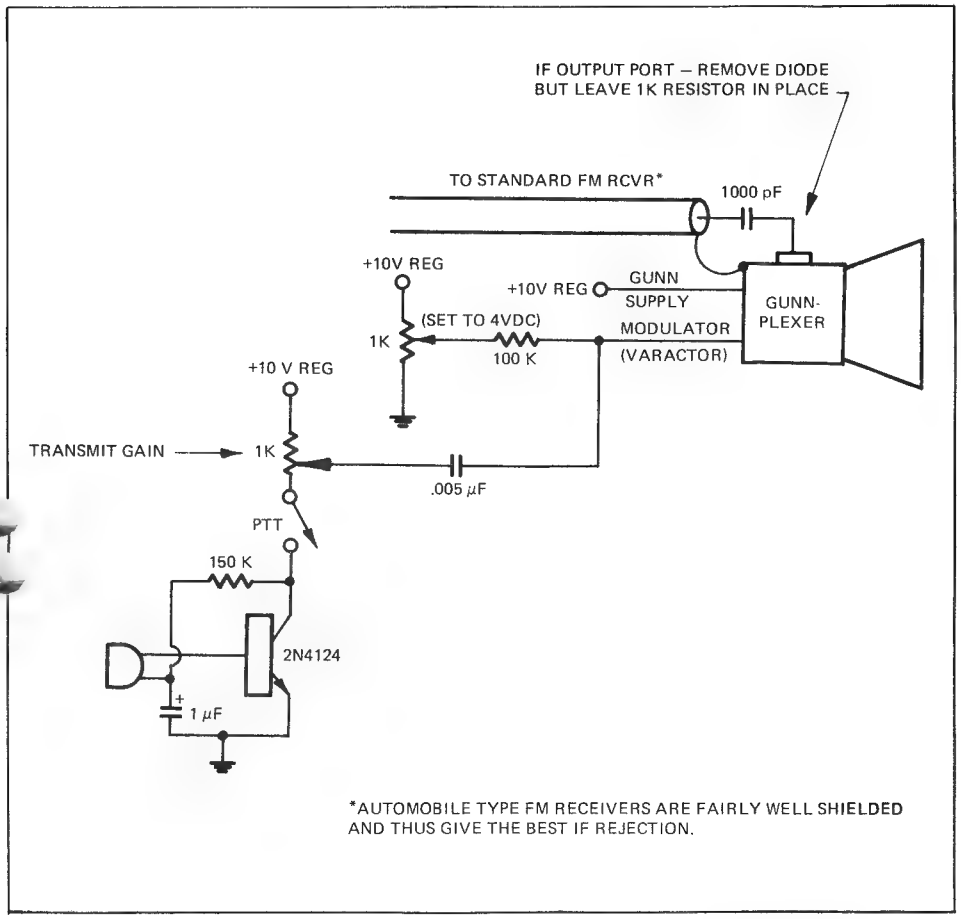


FIG. 3 (Left): 10 volt Regulator for Gunnplexer will hold Regulation down to 10.5 volts on input



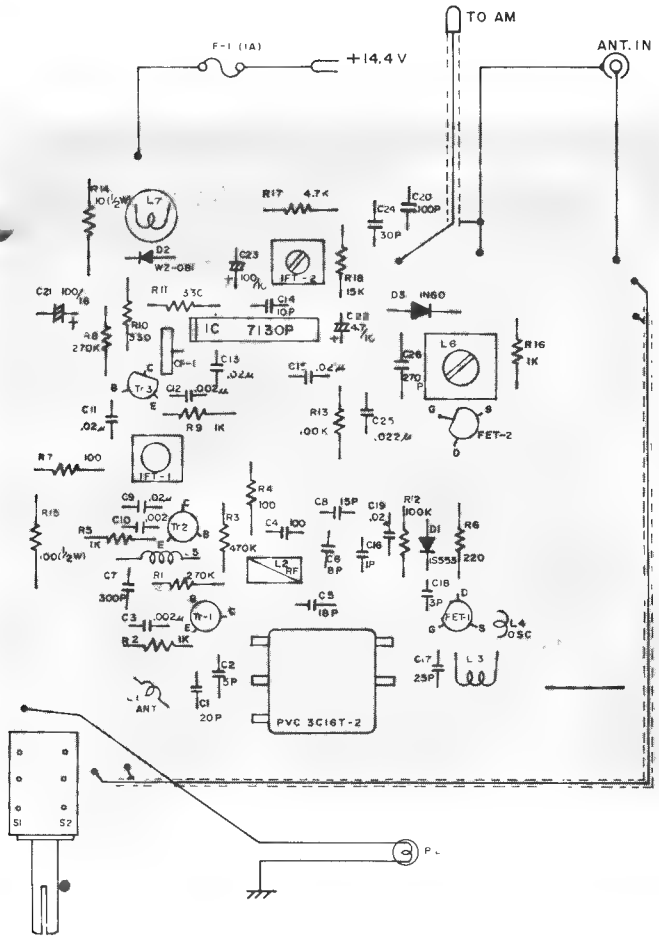


FIG. 2: (Above) Hook-up for other end of Simple Gunnplexer Link (free running)

Left: Printed Circuit Board with Component Placing

TRY THIS

WITH THE TECHNICAL EDITORS

VOLTAGE REGULATOR NOISE SUPPRESSION

Bill Pearson VK2LH

Having fully suppressed the ignition system on my HQ I was still troubled by the rough noise caused by the vibrating voltage regulator. All my attempts to bypass with capacitors and shielded cable between alternator and regulator were only marginally successful. The noise was completely eliminated by winding 30 turns of about 18 SWG enamel wire on two small toroid cores and connecting them in series with the "D" and "F" leads at the terminals of the regulator.

The ignition system is fully shielded with braid and tinplate, but the toroids made a tremendous difference. ■

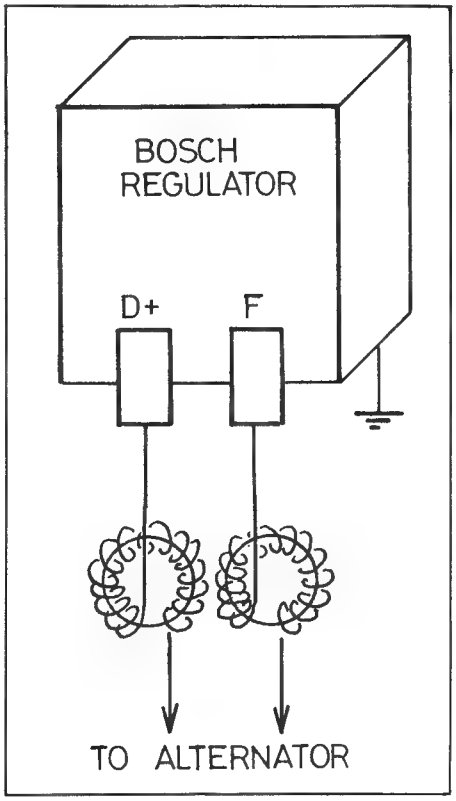


FIG. 1: Torroid Connections

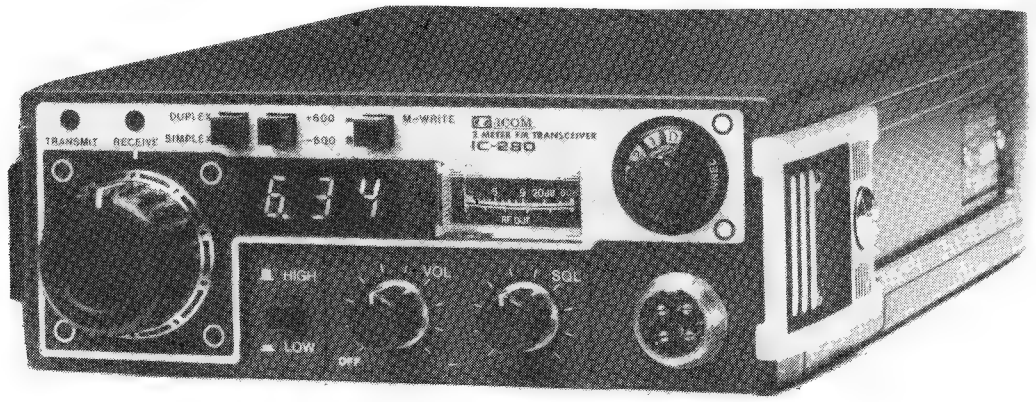
QSP

10 GHz TESTS

A 10 GHz contact was made on 25th March 1978 between VK2AHC at Jervis Bay and VK2JJ at Stanwell Tops, a distance of 94 km. Signals were R5S5. Thus while no new records were made much valuable experience was gained. Various tests were also made on 3.3 GHz. — The Propagator, April 1978. ■

JOTA 1978

News from VK4ZNI, the National organiser, is that the Jamboree on the Air this year on 21st and 22nd October will be special as it is the 21st JOTA for Scouts and Guides. Make a note in your diary and contact your State Scout or Guide branch organizer. ■



IC-280, the Remotable 2meter Mobile

This microprocessor controlled unit provides memory and synthesis requirements for the most critical FM operator. The PLL control is located in the detachable front section of the radio, providing memory and frequency control for the main section, which is remotely mountable with an optional three meter, twenty-four conductor cable. With the use of the microprocessor, the **IC-280** can store three frequencies of your choice which are selected by a four position front panel switch. These frequencies are retained for as long as power is applied to the radio. Even when power is turned off at the front panel switch, the **IC-280** retains its memories. When power is completely removed from the radio the ± 600 KHz splits are still maintained.

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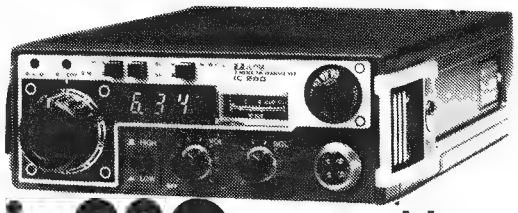

ic-280 remotable

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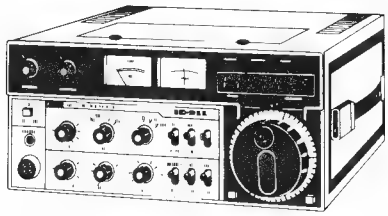

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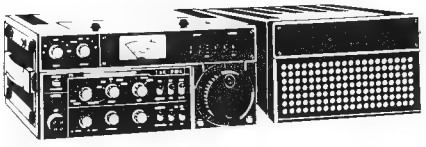

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TIMED MUTING

John Ingham VK5KG

The advent of 2 metre repeaters brought better quality communications between mobile stations, and the use of repeater channels as calling frequencies. Unfortunately these two do not mix very well.

WICEN provides a good example of this. On one hand it would be desirable to contact WICEN members by radio at any time, but on the other hand it is clearly impractical to leave a 2 metre FM receiver running for 24 hours a day in any ham shack or home. To do so would severely hamper operations on other bands. Not to mention possible divorce suits! What is needed, then, is a device which when attached to a receiver, will allow an *initial* call of a QSO to be heard, but which will mute the rest of the QSO. The circuit to be described is such a device based on several timers. In addition, short transmissions of a second or so duration (such as caused by "button pushers") are ignored.

In designing the device I decided to use CMOS ICs for simplicity and to avoid having to include a voltage regulator as would be the case if TTL were used. The particular 2 metre rig I use is an ICOM IC22S, but the concept is adaptable to any rig, particularly the more modern transceivers which feature a lamp which is lit upon receipt of a signal. More on possible adaptations later.

DESCRIPTION OF CIRCUIT

The indication of a signal being received is provided by zero volts on the "cold" side of the "signal received" lamp of the IC22S. The presence of 12 volts indicates absence of a signal. This line is fed to the outboard timed-mute unit via the multi-pin socket on the rear apron of the IC22S, whereupon it is integrated by an RC network. R1 is adjusted so that a signal must be present for at least a second before being accepted. (This is so as to ignore "button pushers".) The Schmitt-trigger squares up the leading and trailing edges of the logic signal so as to make it more acceptable to the following multivibators which require a sharp transition for correct operation.

In a nutshell, the operation of the device from here on can be summed up as follows: left to itself monostable "A" (which triggers on positive going transitions) would allow the first 5 or 6 seconds of *each* over to be heard, however monostable "B" (which triggers on negative going transitions) prevents "A" from working within 10 seconds of *loss* of a signal. Even at the end of those 10 seconds if a signal is present "A" will not retrigger because it requires a *transition* in order to work. Further, in the event of temporary loss of signal due to say QSB, monostable "B" is prevented from cutting short "A's" time out by the use of an inhibit from "A". This also retriggers "B" in the event that the duration of reception of the signal is less than the run time of "A".

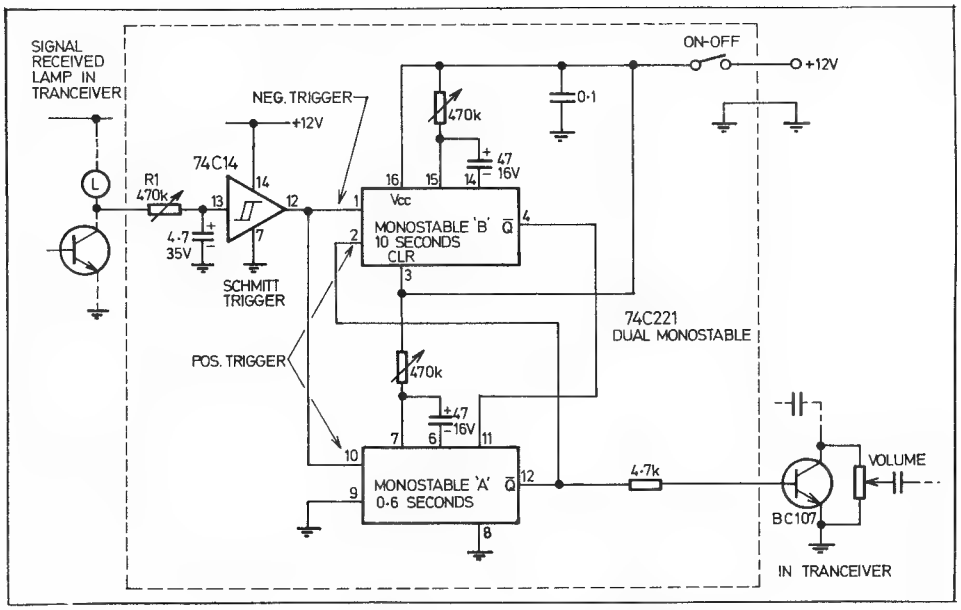


FIG. 1. Timed Mute Circuit.

The output of monostable "A" has the reverse of the polarity which might at first be expected, +12 volts means mute, zero volts means unmute. This is done deliberately so that by the simple expedient of switching off the power to the device, or by unplugging it, the transceiver continues to function as was originally intended.

The means of applying muting to the transceiver is, in the case of the IC22S, simplicity itself. ICOM have conveniently used decoupling capacitors on both the input and output of the volume control. Thus without having to worry about upsetting DC levels an NPN transistor such as a BC107 can be connected across the volume control (emitter to ground) with the base connected via a current limiting resistor to the output of monostable "A". When the device is disconnected, switched off, or when monostable "A" is running, there is no forward bias on the transistor. It therefore is OFF and has no effect on the normal operation of the transceiver. However when muting is required the transistor is forward biased and in effect shorts out the audio at the volume control.

It is obviously impractical to give details of connections for every make of transceiver currently in use. However, several generalizations can be made. Any transceiver with a lamp to indicate receipt of signal can be used. If the polarity or sense of the logic so obtained is the reverse of that provided by the IC22S as described above, one of the spare Schmitt-

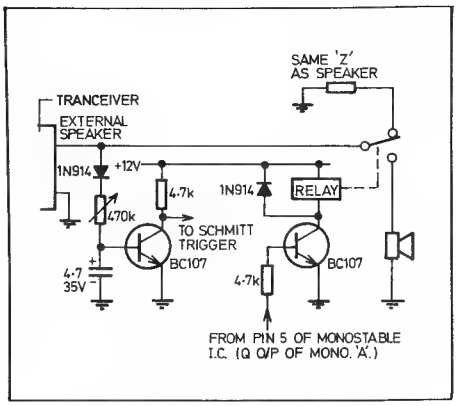


FIG. 2. Suggested Interface Circuit.

triggers can be used to invert it. Those transceivers without capacitive coupling either side of the volume control could quite likely be modified accordingly. Where this is not possible the following might be tried. Those amateurs who do not wish to modify their rigs may also wish to try the following which, although it has not been tested, should work.

The transceiver audio output is connected to an external speaker via the contacts of a muting relay which is driven by monostable "A". A sample of this loudspeaker signal is rectified and used to trigger the time-mute device. (This signal, after rectification and integration-filtering, needs inverting and amplification before being presented to the Schmitt-trigger.)

Although this time-mute device has only been in existence a short while, the times given above are a result of experience and should be adhered to for the sake of uniformity. Unlike tone-encoded calling systems, this device allows amateurs without special equipment to call equipped stations. It also allows the receipt of CQ, Mayday and other type of general calls.

Reproduced from WIA SA Journal, April 1978. ■

A 144 MHz LINEAR AMPLIFIER

Greg Taylor VK7ZYT
94 Berriedale Road, Berriedale, 7011

A 144 MHz LINEAR AMPLIFIER

There are several fully solid state, low power SSB transceivers available commercially now and these have made a big impact on the activity on the VHF bands.

However, in most cases, the low power is a limtation to the serious DXer. This also applies to many home brew exciters and transverters with only 1-3W PEP output.

With this in mind an amplifier was designed for use with SSB drive from 1W to 5W PEP and 10W to 12W PEP depending on the configuration constructed.

The variations to the amplifier are as follows:—

(1) Driver stage only using a 2N5590 will deliver 10W with less than 1.5W PEP of drive.

(2) Driver stage only using a 2N5591 will deliver 20-22W with 4W of drive.

(3) Driver stage using 2N5591 and two 2N5591 in the output stage. This combination will deliver 40 to 45W with less than 2W of drive.

(4) If the drive available is only 1W, a 2N5590 can be used to drive two 2N5591s to about 40W output.

(5) The output stage only can be built using two 2N5591 and will deliver 50W with 10W to 12.5W of drive.

It is only necessary to construct the relevant section of the PCB.

A few years ago, I used 2N5591s in a broadband HF linear with very pleasing results. One aspect about using these transistors in linear service that became apparent is the lower output power obtainable with the output available in class C.

Although 30W or more can be obtained in class C service, only 20 to 25W can be obtained from a class AM linear when using a 2N5591, if intermodulation distortion products are to be kept low.

The use of a 2N5591 as a driver in this amplifier may seem extravagant, but this is necessary to keep intermodulation distortion to a minimum by allowing the driver to loaf along. The output stage can then be driven further into the gain compression region before the combined distortion of the two stages becomes excessive.

If the drive available is only 1W PEP and less than 40W PEP output is satisfactory, the 2N5590 is quite suitable as a driver.

POWER SUPPLY AND BIAS

Two important aspects that must be considered when designing and building transistor linear amplifiers are bias and supply regulation.

The power supply should be regulated to within 2 per cent for load variations from 1A to 10A. This includes the voltage drop due to leads, fuses, relay contacts and terminals.

To avoid these problem areas, I suggest:

(1) very short and heavy leads between the power supply and amplifier.

(2) a short circuit protected power supply instead of line fuses; and

(3) Instead of switching the supply rail directly, switch the voltage regulator at a low current point, i.e., the base of the main pass transistor or driver.

BIAS

A very important subject.

There are two methods of biasing the RF power transistors.

(a) forward biased diodes;
(b) transistor regulated sources.

The transistor bias supply is preferred because of its lower output impedance and a wider degree of control over its operating parameters, however it is more complicated than the diode method and was considered unnecessary for an amplifier at this power level, where forward biased diodes can provide good results.

The diodes are in contact with the transistor package so that the bias voltage will approximately track the transistors' base-emitter voltage variation with temperature. The risk of thermal runaway in the transistors is thus minimised when the transistor junction temperature rises when dissipating heat with drive applied — linear amplifiers are typically 50 per cent efficient.

The second function of the bias network is to maintain the DC bias and hence the conduction angle of the base current — approximately 180° over the drive range.

If the bias network is poorly designed and has a high output resistance the DC bias voltage will be reduced by the reverse current flow in the network due to the rectification of the drive signal by the base/emitter junction. This results in a conduction angle of less than 180° and causes distortion to increase. If taken to extremes it is possible for a supposedly AB amplifier to shift into class C at or near full drive, if not sooner.

With simple bias networks such as the diode type a low impedance can only be achieved with high bias network current. In this amplifier each network passes approximately 200 mA.

Separate bias supplies are used for each output transistor to alleviate individual selection of the transistors for similar base turn-on characteristics. It is advisable to select transistors with the same batch number.

At this stage I would like to offer a simple test to those who already have transistor linear amplifiers. Measure the DC voltage on the base of the output transistor through a RFC or low value resistor (e.g. 1k). Apply drive and increase to full output, if the DC voltage (typically 0.5-0.6V) falls appreciably or reverses, the bias network is inadequate and should be revised.

Some variation is unavoidable with simple networks and must be accepted.

CONSTRUCTION NOTES

The amplifier is built on a double-sided fibreglass board to aid stability. The only active track on the underside of the board is used to link the supply rail between t two output transistors.

The PCB should be mounted appro mately 2 mm away from the heat sink so that the transistor leads rest flat on the copper without bending. Before mounting the transistors the leads should be cut to 3/8 inch length, then the outer 1/8 inch bent up vertically, this enables easier installation and removal.

The 1000 pF chip capacitors are soldered to the PCB by first tinning the copper track then lying the chip capacitor on the tinned area. Apply the soldering iron to the top side of the capacitor until the solder melts underneath.

The links between both sides of the PCB are short lengths of No. 16 copper wire soldered to the copper tracks.

The three bias diodes are placed across the emitter leads of the transistors with some silicon grease or heat conductive glue between them and the transistor package.

All capacitors should be soldered to th PCB with leads as short as possible take care not to overheat them when soldering.

Transistors are more prone to thermal instability and failure when operated in a linear mode than in class C. Therefore the heatsink should have a large effective area and should have good ventilation.

TRANSISTOR TYPES

The 2N5590 and 2N5591 transistors have been used in this amplifier as they are readily available and inexpensive. Also they have been proven to give good performance as linear amplifiers for amateur use.

Although it has not been possible to

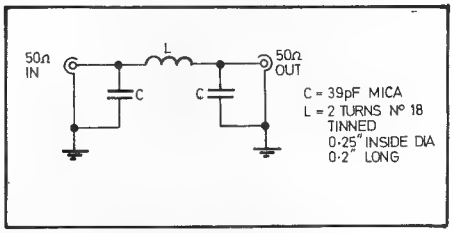
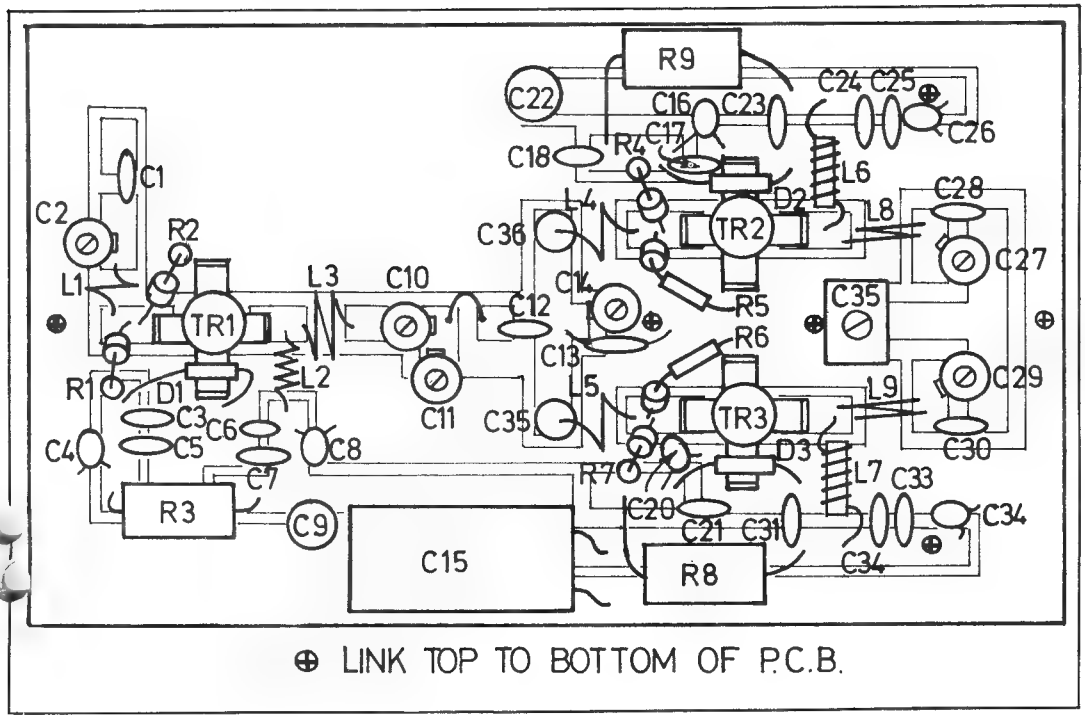
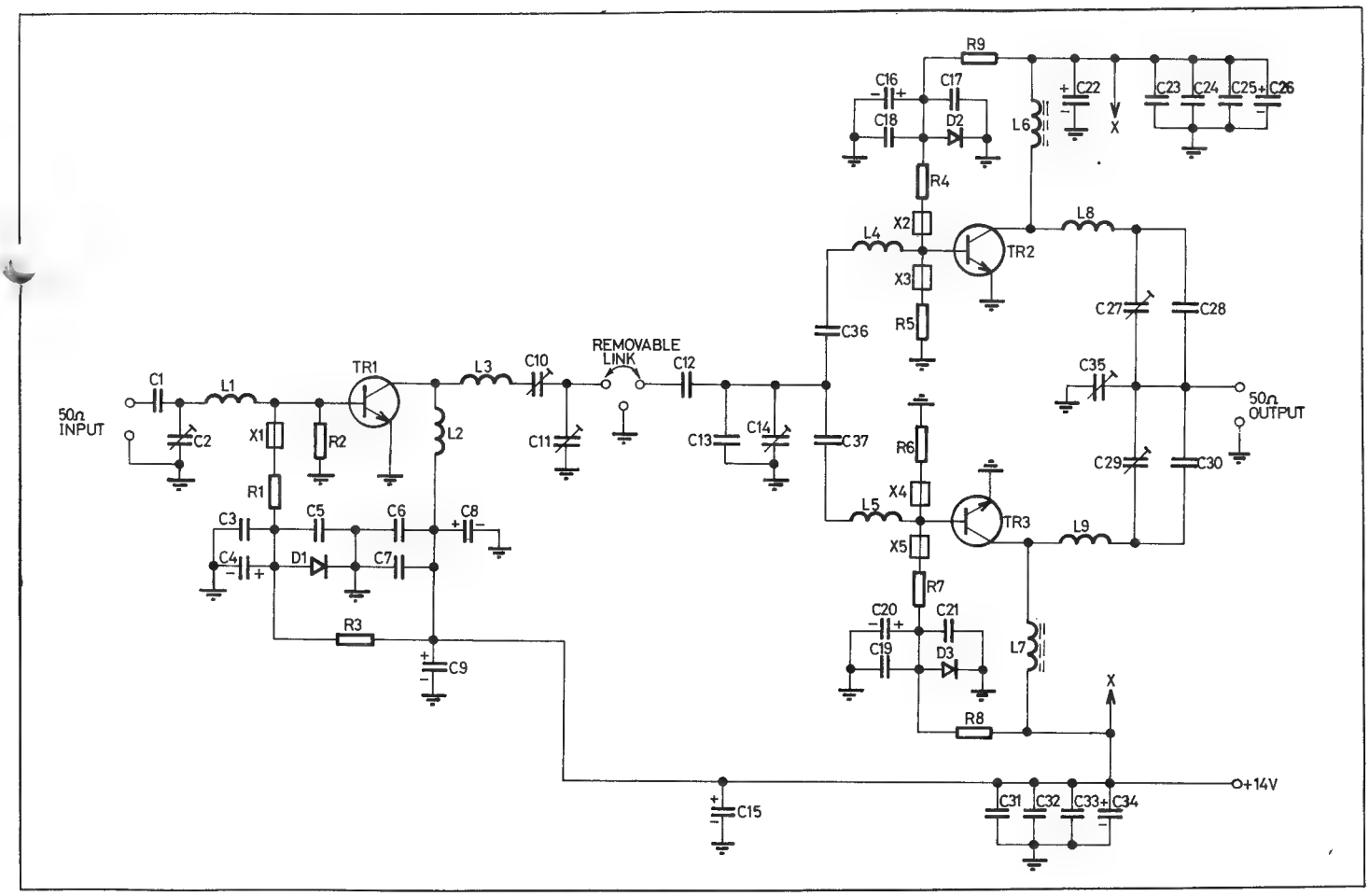


FIG. 1. Harmonic Filter.



LEFT:
FIGURE 2.
PCB Component Layout (actual size).

BELOW:
FIGURE 4.
144 MHz Linear Amplifier Circuit.



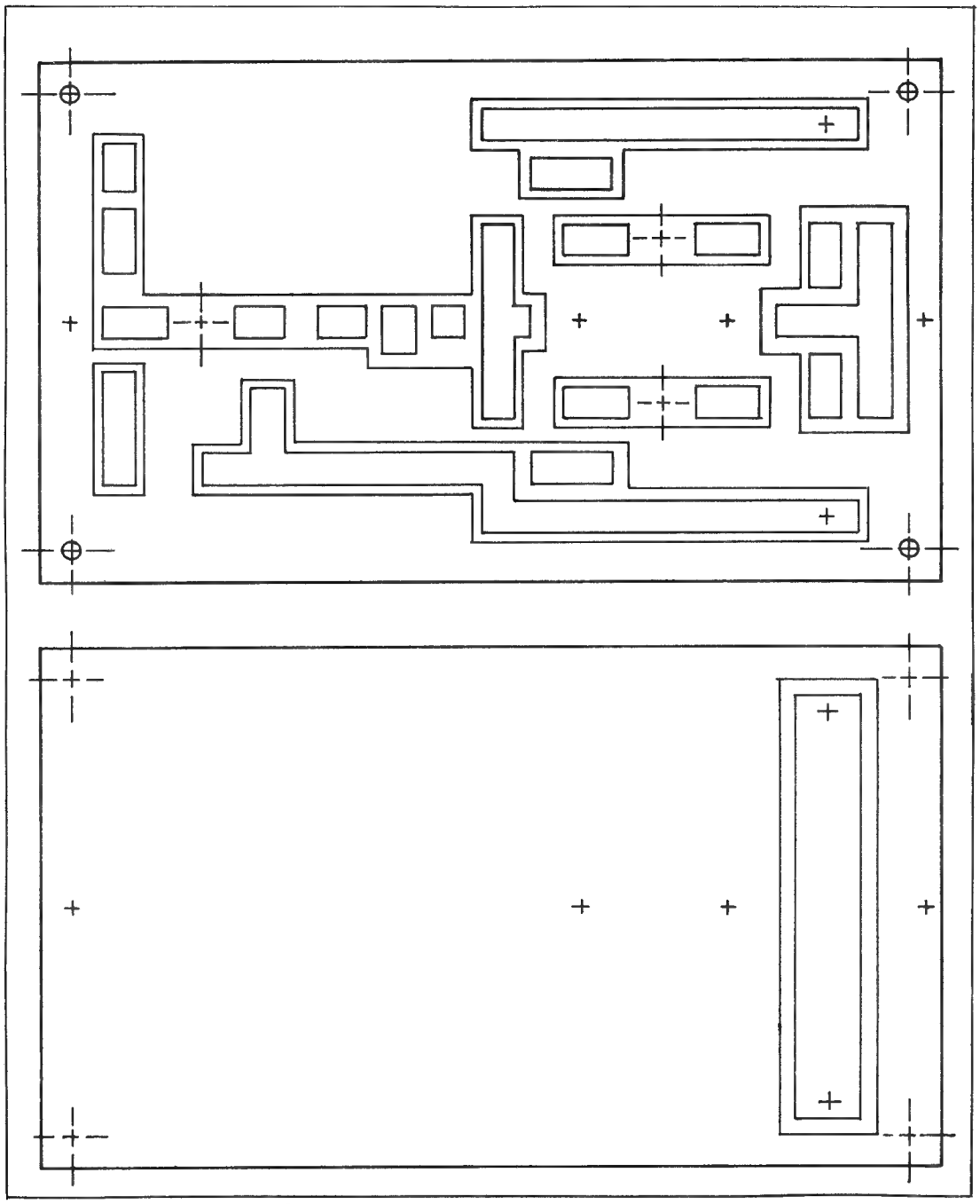


FIGURE 3
Double-Sided Printed Circuit Board Layout (actual size).

measure the intermodulation distortion of this amplifier, other amplifiers have exhibited i.m.d. of —25 dB at similar power levels using 2N5591s.

Other transistors that might be suitable are:—

- instead of the 2N5590 — B12-12, BLY88A, 2N6081.
- instead of the 2N5591 — B25-12, BLY89A, 2N6083.

TUNE-UP

TO ADJUST BIAS

(1) Terminate the amplifier input and output with 50 ohm.

(2) Disconnect the supply end of R3, R8 and R9.

(3) Apply 14.5V DC to the amplifier via a 250 mA meter.

(4) Connect R3 to the 14.5V supply before the above current meter, i.e. do not allow the current through R3 to indicate on the current meter.

(5) Adjust the value of R3 to give 100 mA to 120 mA of IC. Disconnect the supply from R3.

(6) Repeat steps (4) and (5) with R8 and then R9. Each time leave the resistor disconnected from the supply after selecting the correct value. The IC of TR2 and TR3 should be set at equal values between 100 and 120 mA.

(7) Disconnect the supply and solder the three bias resistors in place. Keep them away from the PCB and other components as they become very hot.

TUNING THE DRIVER STAGE

(1) Connect the output of the driver to a power meter. If possible, keep a load on the output stage. This stage is quite stable without a load, but it pays to be careful.

(2) Connect the output of the exciter to the driver input via an SWR bridge or directional power meter.

(3) Apply power to the amplifier.

(4) Apply CW drive to the driver at 0.5W to 1W. Start with C2, C10 and C11 at half mesh.

(5) Adjust C10 and C11 for maximum output power.

(6) Adjust C2 for minimum SWR. It should be possible to achieve better than 1.05 : 1. Minimum SWR should correspond to maximum output power.

(7) Increase drive to a maximum of 2W and repeat the adjustment of C10, C11 and C2. If necessary, adjust the spacing of the turns of L3 to obtain maximum output 10 to 12W.

TUNING OF OUTPUT STAGE

(1) Remove the load from the driver and connect to the output of the final stage.

(2) Join the links between the driver and final stage.

(3) Set C14, C27, C29 and C35 to half mesh.

(4) Reduce the output from the exciter to 0.5W.

(5) Apply drive and adjust C27, C29 and C35 for maximum output power. Then adjust C14 for maximum output.

(6) Repeat the adjustment of C27, C29, C35 and C14 for maximum output.

(7) Increase drive to 1W and repeat step (6).

(8) Increase drive to about 2W and repeat step (6). This should result in 40W to to 45W output power.

- DO NOT RE-ADJUST C2, C10 OR C11.
- DO NOT ATTEMPT TO TUNE THE WHOLE AMPLIFIER IN ONE GO.

If the drive available from the exciter exceeds 2 watts PEP insert small attenuators between the exciter and driver stage.

Use standard 50 ohm atten. networks and use resistors with power ratings consistent with the power being dissipated in the attenuator. Alternatively use lengths of lossy coax.

If only the driver stage has been built maximum drive for the 2N5590 is 2W PEP or 4W PEP for the 2N5591.

OPERATION

It is advisable to use a harmonic filter (Fig. 1) after the amplifier to suppress the second and higher order harmonics of the 144 MHz input.

Ensure that the load presented to the amplifier is 50 ohm as any mismatch will result in greater dissipation in the transistors and higher i.m.d.

The ability of these transistors to withstand high SWR at full output is not certain when operated in the linear mode.

I hope this article provides many readers with the necessary circuits or ideas to achieve more 2m DX.

PARTS LIST

TR1 — 2N5591 or 2N5590.
TR2, TR3 — 2N5591.
D, D2, D3 — EM402, etc.
X_2, X_1, X_3 X_4 X_5 — Ferrite head, 5 mm x 3.5 mm.
C1 — 19 pF disc ceramic NPO 100V.
C3, C6, C19, C18, C23, C24, C31, C32 — 1000 pF disc ceramic.
C5, C7, C21, C17, C25, C33 — 0.01 uF disc ceramic.
C4, C8, C20, C16, C26, C34 — 4.7 uF Tant. capacitor.
C12 — 22 pF disc ceramic NPO 100V.
C28, C30 — 68 pF disc ceramic NPO 500V.
C13 — 56 pF mica unencapsulated.
C2, C10, C11, C14, C27, C29 — 5-65 pF Philips 808 series.
C35 — 60 pF Trimmer Philips 809 series.
C9, C22 — 100 uF 16V tubular PCB mount.
C15 — 1000 uF 16V tubular PCB mount.
C26, C37 — 1000 pF chip ceramic cap.
R2 — 22 ohm ¼W or ½W.
R1 — 3.3 ohm ¼W or ½W.
R3, R8, R9 — select on test 5W wire wound. Start at 100 ohm (see text).
R4, R7 — 3.9 ohm ¼W or ½W.
R5, R6 — 27 ohm ¼W or ½W.
L1 — 1 turn No. 20 tinned copper ¼ in. ID.
L2 — 3 turns No. 20 tinned copper 1/8 in. ID, ¼ in. long.
L3 — 2 turns No. 18 tinned copper 3/8 in. ID, ¼ in. long.
L4, L5 — 1 turn No. 18 tinned copper 3/8 in. ID, with 3/16 in. leads.
L6, L7 — 6 turns No. 18 tinned copper wound over length of neosid F29s.
L8, L9 — 1 turn No. 16 tinned copper 3/8 in. ID, with ¼ in. leads.

ADDENDUM

The amplifier was tested by Steve VK7SC with an IC202 driver and 13.5V supply. The intermod. products are —24 to —26 dB down (3rd order) and —34 dB (5th order) at an output power of 40W PEP.

The IC202 had 3rd order products of —30 dB at this drive level.

A six metre version of the driver only has been built and tested and is now in use at my QTH.

The new components for use with a 2N5590 are as follows:—

C1 — 150 pF styro plus 5-65 pF trimmer.
C2 — 270 pF styro plus 5-65 pF trimmer.
L1 — 2 turns No. 18 tinned, ¼ in. diam.
R1 — 3.3 ohm ¼W.
X_1 — 2 Ferrite beads.
R2 — 22 ohm ¼W.
R3 — as for 144 MHz amp.
C3, C4, C5, C6, C7, C8 C9 — as per 144 MHz amp.
L2 — 18 turns No. 26 enam. wire on 680 ohm ½W resistor.
L3 — 5 turns No. 18 tinned, spaced one wire diam., ¼ in. diam.
C10 — 150 pF styro plus 5-65 pF trimmer.
C11 — 100 pF styro plus 5-65 pF trimmer.
D1 — EM402, etc.

The bias resistor R3 should be adjusted to give IC = 25 mA with no drive.

Tune up as for the 144 MHz amplifier.

The 52 MHz version has considerable gain and only requires very low drive.

The gain is typically 15 to 16 dB and only requires about 200 mW for 8W PEP output.

The amplifier was tested on a Marconi TF2370 spectrum analyser and gave the following results:—

At 8W PEP output —
3rd order intermod. — 24 dB.
5th order intermod. — 34 dB.

The driving signal had a 3rd order intermod. of only — 28 dB.

This amplifier is suitable for following a low power transverter only. ■

TRY THIS

WITH THE TECHNICAL EDITORS

RTTY MOTOR AUTO-START

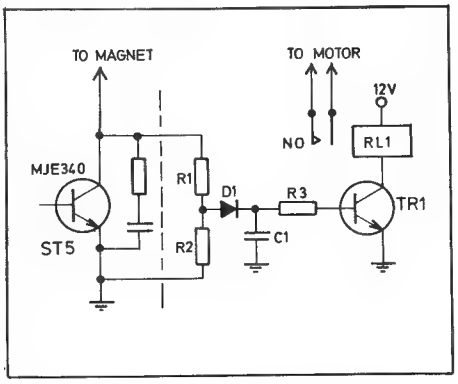
Here is a cheap and reliable motor autostart to fit on the ST5. It features delayed start to stop noise starting the motor when monitoring a mark condition, i.e. monitoring a commercial teleprinter station, and a run on period when the remote station stops sending but maintains a mark carrier.

The circuit diagram is shown below and typical values shown in the table. These values are those used in my motor autostart but may need altering if you use a different transistor. I used an obscure type which looked like it would do the job! The transistor should be silicon as the leakage is important. With these values my motor will start on the second character and stops after 15 seconds. Noise and dips in the signal, if of short duration, do not start the motor.

If used with an Auto-start/Anti-space system it will allow you to monitor a VHF channel unattended.

Barry VK6IF.

(Reproduced from ARTG RTTY Newsletter No. 8, May 1978.) ■



RTTY Auto Start Circuit.

R1 10K ½ watt.
R2 1K 1 watt.
R3 12K ¼ watt.
C1 220 uF.
D1 1N914 or equivalent.
TR1 Any silicon transistor of adequate ratings.
RL1 6-12 volt relay with heavy contacts or commoned contacts.

EQUIPMENT REVIEW —

THE YAESU FT-901DM HF TRANSCEIVER

Ron Fisher VK3OM

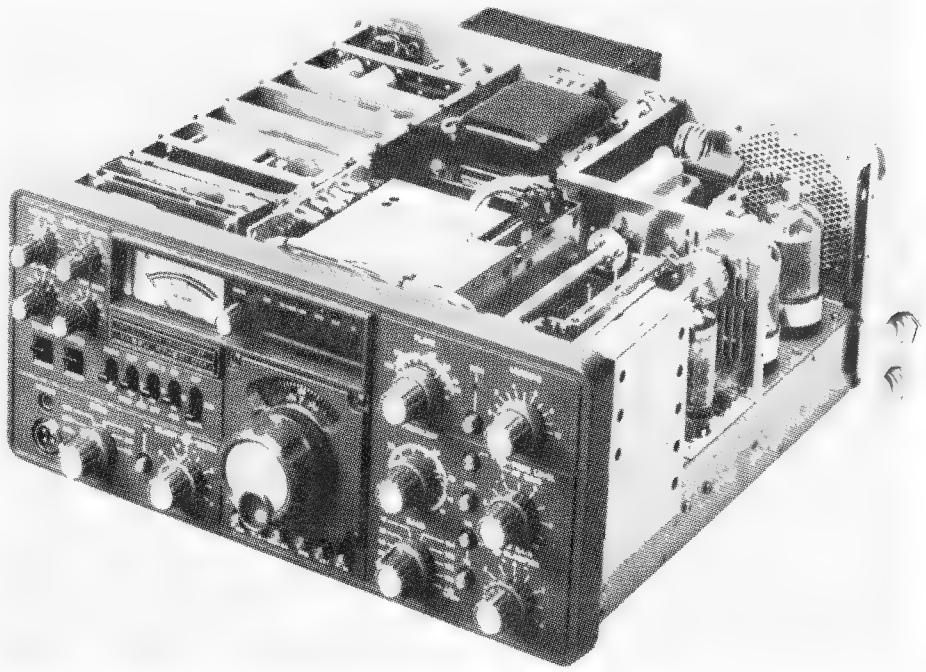
When Mr. Fred Bail, of Bail Electronics Services rang and suggested that I might like to try out the new Yaesu FT-901DM transceiver, I was delighted to do so. The 901 has been the subject of quite extensive advertising and it has been billed as a COMPETITION - GRADE HF Transceiver. Whether this refers to competition with other transceiver manufacturers or competition in the form of amateur contests is not quite clear. However, it seems that it could qualify in both areas. Well, just what does the FT-901DM do that other HF transceivers don't do? Perhaps this depends on your particular requirements, but it is clear that the Yaesu design team must have spent a long time and did a lot of head scratching to think up all the features that have gone into this transceiver. It would in fact be very hard to think of any other feature that could have been added.

Let's look at the list. Digital frequency readout with one hundred hertz resolution, Yaesu's new memory frequency control, Curtis electronic keyer, rejection tuning, variable IF bandwidth tuning, audio peak frequency tuning, RF processing, a squelch system on the transmit audio to eliminate background noise between words, which Yaesu term their AMGC system. In addition to all these there is provision to transmit and receive FM presumably for use on VHF bands with external transverters. A squelch control is included for FM receive.

For the first time as far as I can remember, Yaesu have decided to use 6146s in the transmitter output stage. They also employ negative RF feedback over the final stages to reduce distortion products. All of the usual Yaesu features are of course still there. Ten to one-sixty coverage, selectable AGC, VOX, noise blanker, AC or 12 volt DC operation.

Let's now look a little more closely at the overall design of the FT-901. It bears a similarity with several earlier Yaesu transceivers. Perhaps at first glance it could be called an updated FT-101, and there is no doubt that the 101 must have influenced the designers to quite a large extent. When we look inside, though, there is a resemblance to the FT-301 series.

While we normally don't make mention of competing equipment in these reviews, I am sure that the Yaesu Co. won't mind me saying that the overall appearance is very reminiscent of the Kenwood TS-820. Perhaps the undoubted success of that transceiver reflects in the 901. Whatever, the FT-901DM is a very attractive rig. The new style dial is now fully illuminated with two rotating scales, the larger of which is the kilohertz indicator, and the smaller or inner the 100 kilohertz indicator. The rear illumination is a soft blue which is very easy on the eyes over a long period of operation. "S" meter illumination is also excellent, and is the first translucent rear lit type that Yaesu have used.



A look at the circuit reveals that a great deal of effort has been put into producing a cleaner received signal. A single conversion scheme has now replaced the old double conversion of the FT-101 and the IF used is 8.9875 kHz. The receiver front end uses the usual 3SK40M dual gate MOSFET as an RF stage feeding a source follower stage with two FETs in parallel. The first mixer is balanced with two FETs. In fact a great deal of use has been made of balanced stages throughout circuitry. The IF signal receives some amplification through two parallel connected FETs, and is then fed through a $\pm$10 kHz monolithic filter before going into the switchable filter and the noise blanker. This assures low cross modulation when the blanker is in use. Three filters can be specified in the 901 with the 2.4 kHz SSB unit supplied as standard. A 600 Hz filter for CW and a 6 kHz filter for AM are both optional extras. Output to the FM IF strip is taken out before the switchable filters and taken off to a special FM board which ocntains both the transmit and receive facilities for that mode. The bandwidth control has some very interesting circuitry behind it. The IF signal at 8.9875 kHz is converted to a frequency of 10.76 MHz, where it passes through another filter. However, as the heterodyning crystal oscillator frequency for this conversion is controlled by the bandwidth setting, the actual bandpass can be varied in relation to the normal first SSB filter.

It should be noted that in both the AM and FM modes the bandwidth control is not available. The rejection tuning control operates in a similar way to the FT-301 transceiver set-up. The series resonant frequency of a crystal at the IF frequency is tuned across the bandpass by means of a varactor diode. In the review of the FT-301D we commented on the simplicity of this arrangement and also its effectiveness.

The receive audio section is worth looking at. It incorporates the APF circuitry which used an MC3403P op. amp. as a selective amplifier in a very effective and yet simple circuit. The peak frequency is variable between 400 and 900 Hz.

The digital frequency display on the FT-901DM is controlled by the VFO frequency only and hence requires to be recalibrated when bands or modes are changed. It seems a pity that Yaesu didn't go the whole way and provide mixing for all internal oscillators to give accurate readout. This does not infer that accurate readout cannot be obtained, it can, but the display must be calibrated against the transceiver calibrator to be sure. While on the subject of calibration, it is high time that Yaesu devised a means of changing modes without changing frequency and hence the need to recalibrate. With a transceiver of this complexity there is just no excuse for the lack of this feature.

At long last Japanese designers have discovered that RF inverse feedback produces cleaner signals — a very necessary

thing on today's crowded bands. The FT-901DM is in fact the second Japanese transceiver to incorporate RF feedback but when we consider that the American Collins Co. introduced this back in the late 1950s we wonder why it took so long. Yaesu claim 6 dB of feedback and state their 3rd order distortion products at better than 31 dB below rated output. As this would bring the distortion up to about —25 dB without the feedback, one wonders how the FT-101 and other transceivers produced their "better than —30 dB" specs.

Be that as it may, the 901 does put out a very clean signal. The difference under local strong signal conditions is very noticeable.

The 901 uses the excellent permeability tuning system well perfected in the 101 and 301 series. Combined with the other features mentioned earlier, this helps yet again to contribute to a clean signal on both transmit and receive. The new Yaesu memory is an interesting albeit complicated system. It is a complete synthesizer locked to the normal transceiver VFO. When the memory button is pushed, the VFO counter is latched and the VCO is locked on to that frequency. When recall is required, the output from the VCO is fed into the system in place of the normal VFO.

THE FT-901DM ON THE AIR

Basic operation of the 901 is soon mastered, however it takes time to become acquainted with all the accessories. The new tuning dial is smooth and a pleasure to use. The front finger hole on the tuning knob makes it easy to spin from one end of the range to the other. From personal preference I still like the old protruding spinner that we got used to on most of the older design Yaesu gear, however the new type does look smoother. With both the power and heater switches on, the transmitter can be put straight into the tune mode by using Yaesu's new ten second automatic tune up device. Just push the tune button, the red LED indicator comes up, the transmitter goes into TUNE and you have ten seconds to complete the operation. This feature might help the final tubes live a bit longer when used by some of those perpetual "Tuner-uppers" that we hear so often on the bands. Received audio quality sounded rather restricted and no amount of playing with the bandwidth control seemed to put this right. In fairness, though, it must be said that another member of our technical staff found the audio response to his liking, particularly when using the headphone output. The operation of the bandwidth control was not quite as expected. Having been brought up on the old style communications receivers, I expected the selectivity to increase in a symmetrical manner. This does not happen. Instead one can push the response either higher or lower and so achieve either a lopping off of high or low frequency audio but not both. It is now clear to see why Yaesu offer a CW filter as an optional extra.

The bandwidth control is useful in eliminating interference to some extent, useful for balancing up poor transmitted quality from other stations, but the reject control is by far the more useful of the two. AGC action is smooth in either the fast or slow position — attack time is fast with no hint of any distortion on strong signals.

On the transmit side, audio quality reports were excellent and the RF processor proved to be effective although a little hard to adjust first off. Amateurs who don't possess a monitor scope should take their time and get plenty of reports from locals. Better perhaps, borrow a scope.

Back to receive, the clarifier operates on either transmit or receive or both. Quite a handy feature if you want to shift onto the received frequency when offset.

Not being an ardent CW man I can only say that the built-in Keyer worked very smoothly. The only external attachment needed is a paddle. The keying speed can be adjusted by a front panel control. With the adjustable audio filter, rejection filter and keyer, the FT-901DM makes a superb CW rig. Here at last is a transceiver that has given some thought to the keen CW operator.

The AMGC or automatic microphone gain control, could be useful in reducing unwanted household noises particularly when the processor is in use. It works by providing a threshold level on the microphone amplifier. Input via the microphone below normal close talking conditions just does not come through. Handy if you have noisy children.

The memory system proved a useful feature. While not quite as handy as an external VFO, it does enable split frequency operation. It is possible to transmit on a fixed channel and the receive elsewhere. Very useful if a DXpedition is listening up 10 kHz or you like to work the "Ws" on 40 metres. As we didn't have a two metre transverter available, we were not able to fully check out the FM mode. It does appear to be an economical way to get on to two metres with all modes.

One point mentioned in the FT-901 advertising that needs comment is *Yaesu's unique slug tuning system provides for the possibility of expanded amateur bands at WARC 79.* Perhaps so, but the band switch on the 901 does not have an auxiliary position. So where does the new band fit in?

INSTRUCTION BOOK

The FT-901DM instruction book is in the usual excellent Yaesu manner. Clear operating instructions explain every control in full detail. The circuit description section will enable the new owner to fully understand just how his set operates. A full schematic and block diagram is included, but no circuit board layouts are provided. All points that might need adjustment are clearly indicated.

CONCLUSIONS

While we could not say that the FT-901DM is a "State of the art design", it does offer a startling array of facilities that would be hard to duplicate in any other available transceiver. While the total package is fairly expensive, the 901 is available, less some of these features, at of course a lower price. For the CW man it offers perhaps the best performance package available anywhere and for the SSB man a smooth operating set with just about every convenience he will ever need. Our FT-901 was loaned by Bail Electronics Services, to whom all enquiries on price and delivery should be directed. ■

A SECRETARY'S CONSOLATION

If a secretary writes a letter, it is too long.
If he sends a postcard, it's too short.
If he issues a bulletin, he's a spendthrift.
If he attends a committee meeting, he's butting in.
If he stays away, he's a shirket.
If he offers a suggestion, he's a "know all".
If he says nothing, he is useless.
If the attendance at the meeting is slack, he should have called the members up.
If he calls them up, he's a pest.
If he asks a member for his subscription, he is insulting.
If he doesn't, he is lazy.
If the meeting is a big success, the committee gets the praise.
If it is a failure, the secretary is to blame.
If he asks for advice, he is incompetent.
If he does not, he is swollen headed.
Ashes to ashes, dust to dust,
If the others won't do it, the secretary must.
Anon.—Submitted by Ron Jardine VK3PR. ■

QSP

HOME TRUTH
"It is operating and technical investigation, not regulatory hassling, which are the essence of amateur radio. Were it not for the sheer enjoyment we amateurs derive from the former, we wouldn't concern ourselves with the latter." From QST editorial, Feb. '78.

DX ITEMS
From Feb. '78 QST it is learned that US maritime mobiles must always observe US phone band limitations even when they are outside Region 2. Also that any amateur or club in Quebec province may substitute the prefix VZ for VE to 12.10.1978 inclusive to celebrate Radio Canada TV's 25th anniversary.

LONG DELAYED ECHOES
LDEs have been recorded over a period of many years on HF but nobody has come up with any acceptable answers. A recent impetus was the observation of LDEs by 0Z9CR during EME tests on 7.7.1974 at a time when many solar flares were observed. The frequency of observations however was 1296 MHz and the echoes some two seconds after the return EME signals. This alone has triggered much speculation as set out in two articles in Feb. '78 QST. ■

SOME MODIFICATIONS TO THE VK2BGZ FT101 DIGITAL READOUT

Noel Lavelle VK3ABH
4 Wembley Court, Forest Hill 3131

As it appeared in AR for January 1978, Keith Gooley's Digital Readout is fine, but, as is usual, when I build something designed by someone else, I modified it a little.

I don't question Keith's statement that no birdies are present when using his filter, but looking at the input (not connected to the FT101) a considerable amount of pulse noise was present. If the input impedance of the readout was to be reduced sufficiently to eradicate these pulses it would present a quite considerable load to the VFO line.

With the changes shown to the filter (Fig. 1), the input impedance is high and even with the readout input open circuit no significant pulse noise is present. With the input terminated in about 3000 pF, like the VFO line in the FT101, any pulse noise present is further reduced by a ratio of about 140 : 1 and no pulse noise is detectable. The high input impedance imposes no loading on the VFO line.

I prefer not to use rotary switches when I can avoid them, and felt that the megahertz readout didn't justify setting another rotary switch when changing bands. Keith's method of switching ensures that you will be presented with the correct frequency for the usual mode of operation on speech on any band, but accurate frequency readings are limited to the preselected mode. Use of a different mode on any band would require some mental effort to arrive at the correct frequency. CW readings would, of course, be inaccurate on all bands for which the preselected mode was other than USB.

In my case (Fig. 2) USB, LSB and AM are available on any band at the flick of a toggle switch, and the band start of 0 or 500 kHz is available at the flick of another toggle switch. The price you pay is lack of megahertz display and the necessity of ensuring that both readout and transceiver are in the same mode to obtain accurate frequency readings.

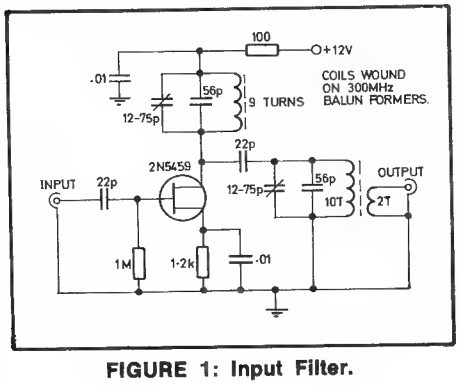


FIGURE 1: Input Filter.

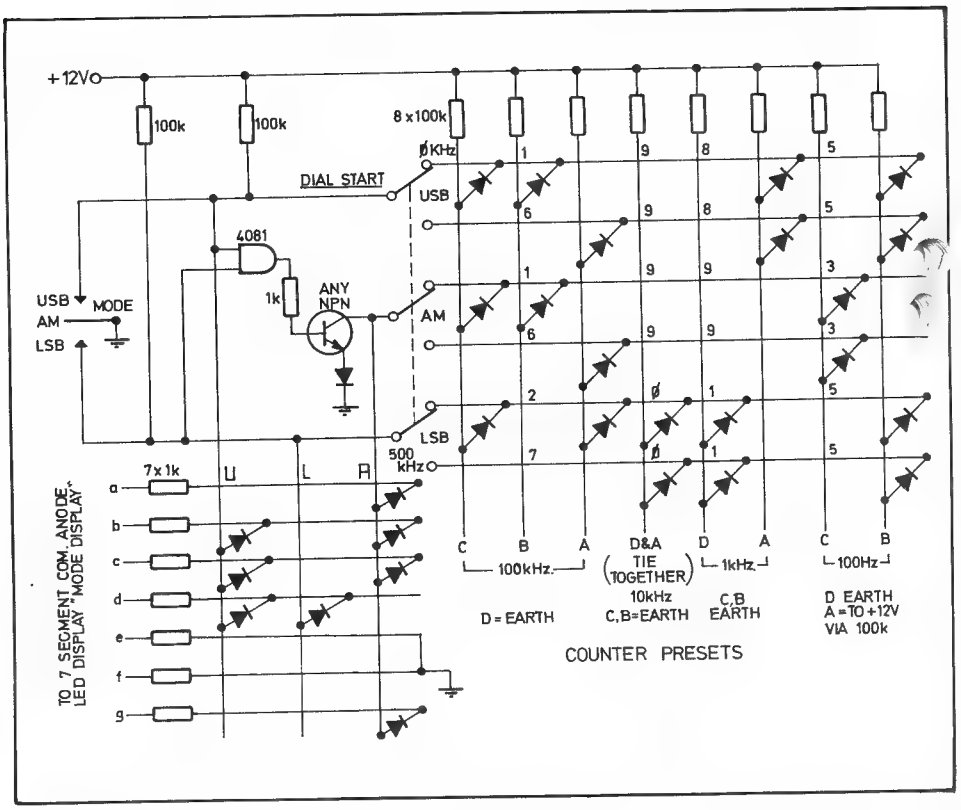


FIGURE 2: Encoding matrix.

I couldn't find a miniature three position toggle switch which made connection in the centre position (all seemed to be centre — off), so I used a logical NAND gate to provide the required ground for the centre (AM) position. The NAND gate is made up of a logical AND gate driving a saturated transistor as the current is in excess of that which a Cmos NAND gate can sink safely.

The binary encoding matrix for presetting the counters shown in Fig. 2 for an FT101B.

The displayed frequency makes it obvious whether one has selected the correct band start (0 or 500 kHz). But I decided that it was worthwhile to precede the frequency display with "U", "L" or "A" as a reminder of the mode for which the display was an accurate presentation (i.e. an upper sideband signal on 14198.5 kHz would be displayed as "U198.5"). ■

THE HAM OPERATOR

My Dad operates a ham radio,
He is a very interesting person,
He has fun with it, talks to it, eats with it and sleeps with it,
I don't know what else but I have my suspicions,
Ham Operators usually treat their rig like a trainer breaking in a colt or training hunting birds.
He spends most of his time with it,
Yes, we see him sometimes,
Yes, we see him go past the table to the back door,
I suppose it's all right, he is a technician, but what Mum gets upset about is that I'm interested in that stuff too, but my Dad's a good Dad and I love him.

Chris

(14-year-old daughter of Wilf VK4ZNZ).

—From S.A. Journal, June 1978. ■

AMATEUR RADIO REPORTS ON COMMERCIAL RADIO STATION

Sam Voron VK2BVS
2 Griffith Ave., East Roseville, N.S.W. 2069

**"YOU'RE TUNED TO 2GB IN SYDNEY 870 kHz
— NOW FOR TONIGHT'S REPORT FOR AMATEUR RADIO ENTHUSIASTS"**

A guide to help you get some amateur radio public relations going within your community via your local disco radio station.

A problem with many PR exercises, whether they be an article in the press, an outdoor demo of amateur gear or what have you — is that they lack regularity and thus some form of continuity which is important if the aim of one's PR is either —

(a) Let the general public find out what amateur radio is and what makes it tick, or

(b) If one hopes to encourage within individuals (newcomers) a growing interest towards one day becoming radio amateurs.

Here are details of a project which has been running in Sydney for some weeks now which could help you in organising amateur PR via your local radio station.

1. Your approach will initially make or break your project — So let's look at the philosophy involved.

(A) **What is in it for amateur radio?** The idea of broadcasting regular amateur propagation reports is of direct interest to amateurs who don't want to miss interesting activities which may be occurring on certain bands at certain times. At the same time this information is excellent amateur PR since the general public are getting to know more and more of what amateurs are doing.

(B) **What is in it for the radio station?** By providing nightly on-air announcements the station can expect to attract a whole group of new listeners who will identify that station as being their station. The station can expect that these new listeners will acquire an identification with and an interest in its programmes as a consequence of this mutual involvement.

2. Taylor your project to the strategy the station wishes to employ and ensure that not only the aims of your project but also the aims of the station are compatible with the way you design your project.

In the case of the 2GB project the strategy used was to design a programme format which would not cause the station to offend or lose any of its existing listeners, and at the same time construct a framework whereby new listeners could be gained. Both aims were achieved by —

(a) Keeping all radio reports to items which were highly descriptive, interesting and entertaining in character.

Disc jockey Chris Curtis goes into action after the weather report over 2GB, giving his listeners a taste of Amateur Radio as he describes the state of the bands 3 minutes past the hour starting from midnight.

(b) Avoiding technical jargon.

(c) Employing the period from midnight till 5 a.m. which the station could make available for such a new project (with possibility of other times available if the project went well and the station's time commitments allowed).

DESIGNING YOUR PROGRAMME FORMAT

The 2GB project involves —

(1) Hourly announcements at 3 minutes past the hour (just after the weather report), commencing from midnight.

(2) The format used was "Today's radio report for amateur radio enthusiasts comes from John VK2XYZ of Lindfield and he reports that . . . and we will have another amateur radio report immediately after the news at . . ."

ORGANISING A ROSTER

I spent a few nights on the air calling "CQ anyone able to join a roster system for compiling propagation reports between midnight till 5 a.m."

(1) Decided to concentrate our effort in the midnight till 2 a.m. segment to start off with and later expand to the 5 a.m. time as volunteers increased.

(2) You want a person to be in charge of organising, maintaining the roster and briefing volunteers' reports to the ins and outs of what's involved including a run-down of the aims of the project from both station and amateur points of view. Briefings on formulating reports into an interesting segment is also important.

(3) Amateurs or short wave listeners were rostered for certain days in the week and advised to phone in their report to the station half an hour before the item was due for broadcast. The organiser, the station manager and those involved in the project had a roster list copy to keep track of those authorised to feed reports into the station.

(4) Any enquiries received at the station regarding reporting or enquiries about amateur radio were directed to phone the organiser of the amateur roster between 8 and 8.30 in the evening.

(5) Contact is maintained with those on the roster by the organiser phoning them the weeks Oscar passes, as well as discussions about new approaches to try. These nets are on 28.5 MHz on Fridays and Saturdays and 1.825 MHz on Sundays. Those on the roster are advised of feed-

back from the station as well as from the public.

Some of the on air announcements within the basic format which identifies the amateur's call sign, name and location have included — "American amateurs are coming in well this morning on the 14 MHz band and to receive the amateur satellite signals turn your aerials skywards for the 7.46 pass."

"Before going to work, Australian country amateurs on the 3.5 MHz amateur band are exchanging news and technical gossip, the amateur satellite will orbit at 5 past 6 this evening, so point your antennas to the sky, that's for the amateur satellite orbiting at 5 past 6 this evening."

"The 28 and 21 MHz bands are dead, but 14 MHz is going flat chat wtih high powered amateurs in the USA and Canada making long distance contacts."

"Conditions on 14 and 21 MHz are very poor and 3.5 MHz is good for communications around Australia, the amateur satellite, by the way, will be available for use at 5.57 this afternoon."

"The conditions which were good for the USA on 14 MHz have now deteriorated and are getting worse and worse."

"7 MHz has been open all morning and the South Pacific stations are coming through loud and clear, and Oscar 8, which is the amateur satellite, will pass over Australia at 9.30 tonight, so make sure that your antennas are pointed up to the sky."

"There are local contacts on 28 MHz and similarly on 3.5 MHz with good signals from New Zealand, the 14 MHz band is holding up well with amateurs from the United States being received well, the most interesting band is 7 MHz where strong signals can be heard from the Pacific area, Asia and South America."

"Conditions on the 15 metre band are unusual this evening in that strong signals are coming in from the States."

Those involved in the roster over the first few weeks of the project who have helped to make it a success are: Mondays and Thursdays, Alex VK2BYO, of Turramurra; Tuesdays and Fridays, Horst VK2BHF, of Dee Why; Wednesdays and Saturdays, Don VK2BXM, of Roseville; Sundays, Simeon VK2NIC, of Killara.

Take a listen — As the project is on a trial basis, its continuance depends on feedback received from listeners. If you hear it and you like it — then send a letter to the Station Manager, Radio Station 2GB, Sydney, NSW. If you'd like to join the roster then phone Sam VK2BVS on 407 1066.

The final point, then, in any project whether you are involved in an article in a paper, a demonstration in a park or at a radio station — provide feedback to those you are involved with if you hope to maintain or expand it. ■

PORTABLE ARMY WIRELESS SETS OF WORLD WAR II

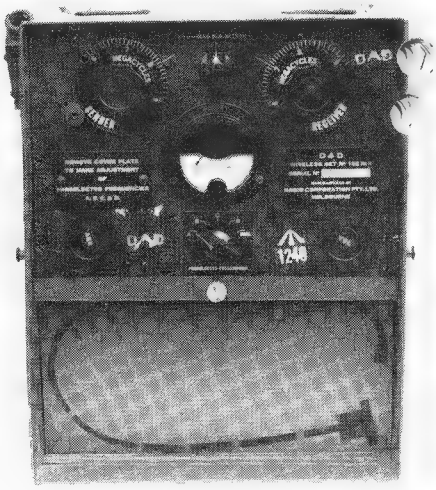
Compiled by R. Champness VK3UG

1. The Wireless Set No. 208 is a 0.6 watt input CW only battery powered HF transceiver. The set operates in the 2.5 to 3.5 MHz band in the Mark II version. The transmitter and receiver are both VFO controlled. The receiver can be used for telephony signals as well as telegraphy. Battery power source consisted of a combination pack with 1.5 volts for filaments and 99 volts for the high tension supply.

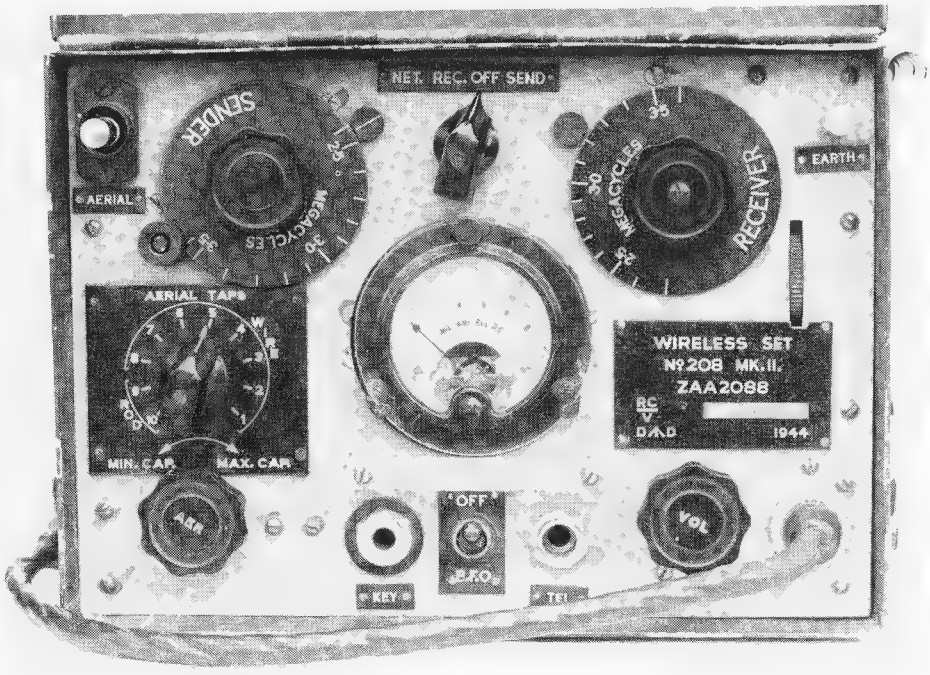
The sets were designed to provide CW communications within an infantry battalion, and I believe were also used by commandos. It is a portable set weighing in at 8.3 kilograms complete with spares, battery and aerials. The set came out of the same factory (Radio Corporation) as the better known No. 108 set, to which it bears a more than superficial resemblance.

2. The Wireless Set No. 108 is a 0.45 watt input AM battery powered HF transceiver and in the case of the Mk. II operates in the 6 to 9 MHz range. The Mk. III version operates from 2.5 to 3.5 MHz. The transmitter and receiver are both VFO controlled. The receiver is designed to receive AM or MCW transmissions. The Mk. I and III have a 455 kHz IF and the Mk. II a 1600 kHz IF. The battery power source is a 1.5 volt battery for LT and two 45 volt batteries in series for the HT.

The sets were designed to provide AM (AM/MCW in the case of the Mk. III) communications within an infantry battalion. The set is tuned up by the operator and then put on his back, whereupon the send receive switch action is extended by bowden cable to the front of the operator. I suppose this set could be considered to be one of the early attempts at a walkie-talkie, although at an all up weight of 18.2 kilograms it could be called a struggle-talkie. The normal range set to set in the manpack mode was at least 3 kilometres. ■



No. 2: Set No. 108



No. 1: Wireless Set No. 208 — Photos by Ken Reynolds VK3YCY.

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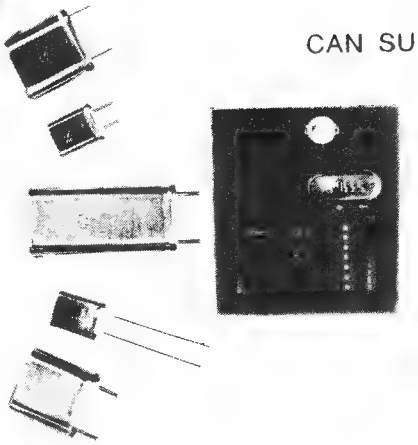

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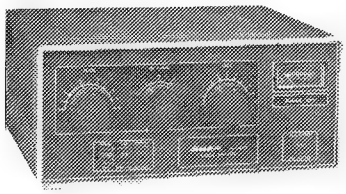

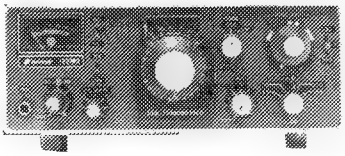

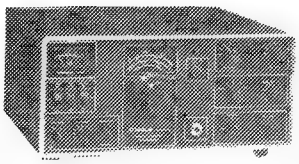

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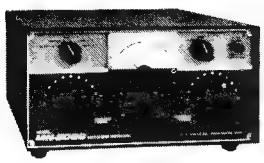

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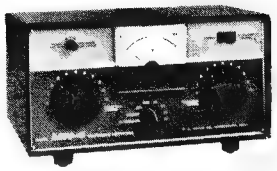

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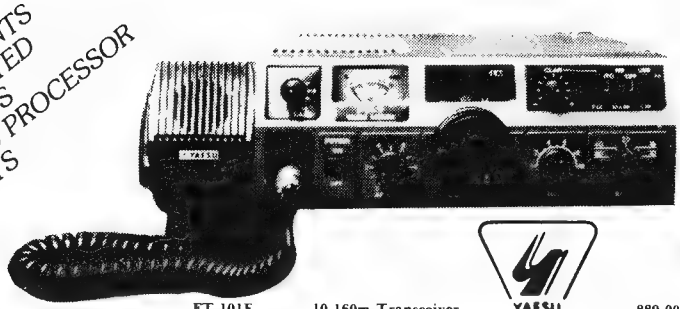

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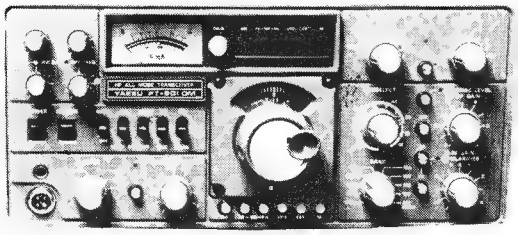

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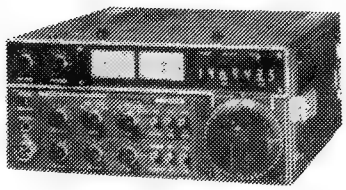
14AVQ/WB	40-10m Trap Vertical	109.00
18AVT/WB	80-10m Trap Vertical	155.00
TH3MK3	10/15/20m 3 el Beam	299.00
TH3Jr	10/15/20m 3el Beam	229.00
TH6DXX	6el Tribander Beam	399.00
LONG HOHN	5el Wide-spaced 27, MHz Beam	180.00
	MISC. ANTENNAS & ACCESSORIES:	
LINDENOW	5/8ths 2m Mobile, Heavy Fibreglass	35.00
BELLING-LEE	Base for above	4.00
KLAMG	Magnetic Bases	19.00
AS-KDA	Spring Mount (Base)	20.50
	COAXIAL CABLE (MIL SPEC):	
RG58AU	1,000 ft. Reels	50c/m
RG58AU	500 ft. Reels	50c/m
	BALUNS:	
AS-BL	For Beams	31.00
BL50A	50 ohm 4Kw for Dipoles	25.00
BL70A	70 ohm 4Kw for Dipoles	26.00
	ANTENNA COUPLERS:	
CNW-217	Incl. swr/pwr Direct Reading, 200w pep max	179.00
CNW-417	Incl. swr/pwr Direct Reading, 500w pep max	219.00
	ANTENNA CHANGE—OVER RELAYS (DAIWA):	
CX-2L	1.8 thru 170MHz, 100w pep max	45.00
CX-2H	1.8 thru 450MHz, 200w pep max	59.00
	COAXIAL SWITCHES (DAIWA):	
CS201	2 Position, high pwr, up to 500MHz, Commercial Qual.	24.00
CS401	4 Position, high pwr, up to 500MHz, Commercial Qual.	49.90
	SWR/PWR METERS:	
VC2	Twin Meters, 3-150MHz with Calibration Chart	34.00
OSKERBLOCK	SWR200, 3-200 MHz, 2/20/200/2000w	75.00
SW410A	UHF 140-500MHz Direct Reading	105.00
SW210A	1.8 thru 150MHz 20/120w Direct Reading, Professional	85.00
SWX777	Professional 1.8 thru 30MHz Direct Reading	131.00

MODEL	DESCRIPTION	PRICE
IC701	HF Solid-State 160-10 m Transceiver	1,180.00
IC701PS	Matching Power Supply/ Speaker for above	245.00
IC202E	2 m SSB Portable, 3 watts	219.00
IC502	6 m SSB Portablem 3 watts	219.00
IC22S	2 m fm Synthesised Tranceiver	299.00
IC211	2m All-Mode Transceiver, AC/DC	785.00
IC245	2 m fm Digital Mobile Transceiver -SSB Attachment for above	465.00 142.00
IC402	70 cm SSB Portable Tranceiver	
RM2/3	Remote Controller for IC701/211/245	169.00
	Crystals for IC215/22 Series (Pair)	10.00
	Crystals for Oscar (IC202E) (Each)	7.50
BC20	Nicad Pack & Charger for Portables	59.00
ICSM2	Condenser—Electret Desk Microphone for ICOM Rigs	56.00
	Brackets for IC22S Series	17.50
	Brackets for Portables	18.00



RTTY EQUIPMENT

WE CARRY RECONDITIONED PAGE PRINTERS, TAPE PERFORATORS, TAPE DISTRIBUTORS, DEMODULATORS, LOOP SUPPLIES, ETC.

15	Page Printer 110V	150.00
14	Tape Reperforator 110V	150.00
14	Tape Distributors 2 Heads 110V	150.00
DT-600	Demodulatro fully build up 170Hz-850Hz	270.00
DT-600	Demodulator Kit Inclusive 12V Power Supply, Meter, all Plugs & Connections	150.00
AFSK	Oscillator, Fully built up	60.00
	Kit includes 6V Power Supply X-Tals for 170 and 850 Hz	40.00
	SLOW SCAN T.V.	
OM-7M	Ham Vision Monitor 4 inch Monitor Screen	1400.00
OM-7C	Ham-Vision Camera	
	LOW PASS FILTERS (DAIWA):	
FD30M	32MHz Fc, 1Kw, 3 stages, good qual.	33.00
FD30LS	32MHz Fc, 1Kw, 3 stages, good qual.	20.00
	OMEGA NOISE BRIDGE:	
TE7-01	Up to 100MHz	44.00
	POLAMAR PRODUCTS:	
	IC Keyer	149.00
	VLF Converter	89.00
	Receiver Noise Bridge	79.00
	QM70 PRODUCTS:	
	432/144MHz Converters	59.00
	432/28MHz Converters	59.00
	144/28MHz Converters	59.00
	1296/28MHz Converters	70.00
	28/144 "SCORPION" high power Transverter	225.00
	2m Linear amp 70w max pep	129.00
	2m/432MHz Transverters	125.00
	COMPRESSORS & PROCESSORS (DAIWA):	
RF440	Speech Processor, phasing type, 6dB Gain	125.00
RF550	Speech Processor, Crystal Filter Type, 6dB Gain	165.00
	MORSE KEYS (HI-MOUND):	
HK702	Delux Key with Marble Base	38.00
HK708	Economy Key	21.00
HK706	Operator's Key	25.00
MK701	Manipulator (Side-swiper)	43.00
EK103Z	Electronic Keyer	165.00
	MICROPHONES:	
VM-1	Noise-cancelling, Dynamic, Low Z	9.50
VM-2	Desk Mike with Pre-amp, Dynamic, Low Z	29.80

SIDEBAND ELECTRONICS IMPORTS

P.O. BOX 23, SPRINGWOOD, N.S.W. 2777

WAREHOUSE: 78 CHAPMAN PARADE, FAULCONBRIDGE

TELEPHONE: (047) 51 1394 A.H. (047) 54 1392

HYGAIN antennas have finally arrived, sorry to have to increase the 204-BA price, they cost me now only a few dollars less than the TH3-MK3. The Japanese YEN is now so dear to us that the equivalents of the FT101E, TS-520S and TS-820S retail prices in Japan are now $820, $660 and $1,070 respectively. Importers pay more than 25 per cent in freight, insurance and sales tax, so new imports of these and other YAESU and KENWOOD items will have to go up.

Still available are XEROX copies of service notes for various KENWOOD transceivers and HYGAIN antenna manuals. $1 for most (no cheques please, they cost now 22c to process), $2 for more bulky manuals. TS-520S or TS-820S **service** manuals are 40-80 pages or $6-$12 our cost to copy.

HYGAIN ANTENNAS:

18-AVT/WB 10-80m vertical 23 ft. tall	$125.00
TH6-DXX 10-15-20m senior 6 el Yagi 24 ft. boom	$300.00
TH3-MK3 10-15-20m senior 3 el Yagi 14 ft. boom	$240.00
TH3-JR 10-15-20m junior 3 el Yagi 12 ft. boom	$175.00
204-BA 20m 4 el Tiger array 26 ft. boom	$230.00
HY-QUAD 10-15-20m full size Cubical Quad	$260.00
11m 5 el Yagi suitable 10m, w/elements adjusted	$70.00
2m 8 el Yagi with balun 12 ft. 6 in. boom	$30.00
BN-86 balun for HYGAIN beam buyers only	$20.00
BU-8 Japanese baluns suitable for 5 el 10m beams	$14.00

YAESU MUSEN PRODUCTS:

FT-101E, FT-901D, FT-7, FL-2100B	P.O.A.
FRG-7 .5-30 MHz general coverage receiver	$350.00

ROTATORS:

CDR HAM III rotators on order, expected early October 1978.

KEN KR-400 Azimuth rotator w/28V AC control box	$115.00
KEN KR-500 Elevation rotator w/28V AC control box	$140.00

ACCESSORIES & COAX CONNECTORS:

SWR-50A twin meter 3.5-150 MHz 1 kW SWR/Pwr. meter	$22.00
FERRIS SWR/Field strength meter	$15.00
Bumper mount with 3/8 in. thread antenna mount	$7.00
Gutter mount with 3/8 in. 24 thread antenna mount	$4.50
5m lengths RG-58U with PL-259 one end	$3.00
M-ring body mount	$3.00
12V regulated supply	$26.00
GLP Right angle RG-58U to SO-239 w/lock nut and weatherproof cap	$3.50
MLS Right angle RG-58U to PL-259	$0.90
PL-259 standard or solderless — RG-8U and RG-58U	$0.75
In-line splice RG-8U and RG-58U	$0.75
SO-239 chassis connector 2-hole or single w/lock nut	$0.75
Right Angles and T-connectors	$1.50
Double male connectors	$0.85
Mic. sockets, chassis or in-line, 3 or 4 pin	$0.85
3 circuit mic. jacks	$0.85
2 ft. 6 in. coloured leads w/crocodile clips — 5 for	$3.00
Crystals for QUARTZ-16 2m transceiver: Channel 51 T/R 146.55; Channel 64 T/R 147.22 — pair	$5.00
No. 14 hard drawn copper wire — per metre	$0.10

KENWOOD PRODUCTS:

TS-520S 10-160m SSB/CW transceiver, 240V AC	$700.00
TS-820S 10-160m SSB/CW w/digital readout	$1,100.00
TS-700SP 2m all-mode transceiver	$800.00
TR-7400A 2m transceiver	$475.00
TR-7500 2m transceiver	$275.00
DG-5 digital display for TS-520S	$200.00
TV-506 6m transverter	$225.00
TV-502 2m transverter	$250.00
AT-200 antenna matchbox	$175.00
DS-1A DC-DC converter	$70.00
DK-520 adaptor for DG-5 to TS-520 use	$20.00
LF-30A low pass anti-TVI filter	$30.00
VFO-820 external VFO for TS-820S	$175.00
VFO-520S external VFO for TS-520S	$150.00
SP-820 external speaker for TS-820S	$60.00
SP-520 external speaker for TS-520S	$30.00
YG-88C CW filter for TS-820S	$55.00
YG-3395C CW filter for TS-520S	$50.00
MC-35S hand-held microphone	$20.00
HC-2 Ham clock	$25.00
SM-220 Station monitor	$300.00
BS-5 (TS-520S) and BS-8 (TS-820S) pan adaptors for SM-220 — each	$55.00

OTHER TRANSCEIVERS:

ATLAS 210X 10-80m Mobile transceiver w/HD cable	$825.00
ICOM IC-202 2m SSB portable transceiver	$175.00

NOVICE SPECIALS — still available at these low prices:

Transceivers for 10m coverage, AM/USB, 15W PEP —	
(a) SIDEBAND SE-502 240V AC/12V DC inbuilt SWR/RF meter 28.300-28.600 MHz	$150.00
(b) UNIVERSE 224m 12V DC 24 ch. 28.480-28.595 in 5 kHz steps, Clarifier operates on transmit and receive	$125.00
Sets of Crystals for Amateur licence holders for converting 23 ch. 27 MHz CB units to 28 MHz, suitable SIDEBAND SE-501A, SE-502, UNIVERSE, KRACO, HY-GAIN V, etc. SSB/AM units:	
Set of 4 crystals converts to 28.3-28.6 (limited quantity)	$15.00
Set of 8 crystals converts to 28.480-28.595	$40.00

All prices quoted are net, ex Springwood, NSW, cash with order, subject to change without prior notice. All risk insurance is free; freight by air, road, rail or post at cost. All orders cleared on a 24 hour basis after receipt with payment.

ARIE BLES (VK2AVA), Proprietor.

ROY LOPEZ (VK2BRL), Manager.

NOVICE NOTES

THE SYDNEY — WELCOME TO AMATEUR RADIO PARTY

Sam Voron VK2BVS
2 Griffith Ave., East Roseville, NSW 2069

With around 400 keen hobbyists having just passed the last novice exam in NSW, a group of amateurs, with the help of the NSW Council, organised a welcome to amateur radio party at the WIA repeater and broadcast site at Dural.

About 80 people, including newly licensed, novice students, old licensees and a host of newcomers, came together for a Sunday of relaxation — BBQing, talking and meeting amateurs for the first time in many cases.

Some of those attending included the new members of the Novice Amateur Radio Group who are conducting novice classes each Saturday afternoon at the local WIA HQ. About eight newly licensed novices from the Amateur and Citizens' Radio Club, which included a complete family team, showed fellow club members the ins and outs of the various home made transmitters and other goodies which were on display.

The Killarney Heights Novice Radio Group (membership of which is restricted to those who have at least a 160 metre modified tranny radio) helped to conduct a coverage test on 160 metres from Dural, where it is hoped that a high power AM signal will soon be spanning the State. You should have heard the 160 metre callbacks after the broadcast! 1825 kHz was packed, stations calling on top of other stations — it was bedlam — it was like a 20 metre dogpile — and it was midday! After about 15 callbacks and numerous subsequent listeners' reports from as far afield as Gosford, we realised Dural must be a 160 metres paradise — and we were only using 20 watts to an inverted Vee antenna.

The welcome to amateur radio party was an opportunity for WIA members to meet all our newcomers and give them a big welcome to the hobby.

In this day and age where the individual newly licensed operator in many cases must fend for himself or herself — this concept of an open invitation certainly encouraged some personal contact between the new and old licensees, many of whom had not yet set up their stations. Lots of practical advice on how to put up aerials for the different bands and what type of gear to start off with, certainly made involvement with this WIA supported activity relevant to the new amateur. In fact so much so that WIA membership applications were going like hot cakes.

Publicity to attract new licensees was via WIA broadcasts on 10 metres (which is very popular for local novice working nowadays), on 11 metres (for those lucky CBers who passed the last novice but still didn't have any amateur gear and were still awaiting their amateur call signs), at the novice group meetings to let the newcomers get involved in the thing they are studying towards, and over 2GB commercial radio to let the general public find out at bit more about our hobby.

The concept of a welcome to amateur radio party was such a success that it is hoped the interest generated within the new licensees and newcomers will spill into other WIA activities.

It is hoped that prior to each amateur exam (four per year) an amateur radio week-end will be held for newcomers and those studying for their licences, and that after the exams a welcome to amateur radio party becomes part of the regular Sydney scene.

Special thanks for organising the Dural site and helping the concept take off goes to Roger VK2ZIG, Jeff VK2BYY, Tim VK2ZTM, Henry VK2ZHE and all the rest of the gang who came along and helped.

PHOTO No. 1

PHOTO No. 2

PHOTO No. 3

PHOTO No. 4

PHOTO No. 5

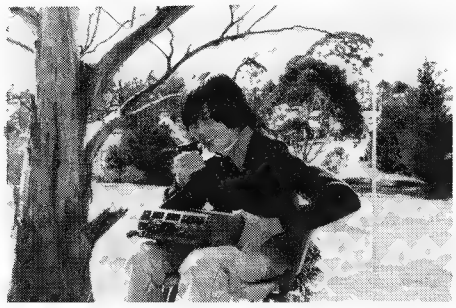


PHOTO No. 6

PHOTO No. 7

PHOTO No. 8

PHOTO No. 1
The welcome to amateur radio week-end takes off with the salute to the 160m test relay of the broadcast on 1825 kHz from Dural. Results showed a superior coverage over the suburban site normally used to originate this relay.

From left, a TS520S, a modified 7 transistor tranny modified on to 160 metres after 3 minutes work, two 10 watt AM portable transceivers on 1825 kHz and a 2 metre FM transceiver. Operating the gear you see Martin Landsdown from the Killarney Heights Novice Radio Group and WIA Councillor Tim Mills VK2ZTM.

PHOTO No. 2
Would you believe that Roger VK2ZIG climbed 50 feet up the tower to put up the 160 metre inverted Vee — shows how keen he is — and he doesn't even have a full call! 1.8 MHz sure must have something going for it.

PHOTO No. 3
Here is part of the display at the Dural welcome. Well known 6 and 2 metre personality Graham VK2ZZV decorates the display with support from Jeff VK2BYY, officer of our VHF and TV group and Dural maintenance team.

PHOTO No. 4
Here is Jeff Pages VK2BYY. Jeff is in action showing the newcomers what makes the Dural repeater channel 8 system tick.

DEMONSTRATIONS

PHOTO No. 5
Brother Cyril Quinlan VK2ACQ, Convenor of the week-end activities, shows us what makes things tick.

MEETING OTHER LICENSEES

PHOTO No. 6
Meet Steven Tilley. Steve and Dad passed their novice exam and are waiting for their call signs and have come along to take a crack at the full licence. Steve, by the way, is one of at least two 12-year-olds who passed the last novice exam in Sydney. His rig is an FT7 and his portable antenna is a chopped down 11 metre ringo. By the way, fingers crossed that the P. and T. drop the age limit on the AOCP by the time Steve is set to go for it!

THE YOUNGEST YL NOVICE?

PHOTO No. 7
Keira James is only 11 years old, she already knows the morse code and wants to become the youngest YL novice at the next novice exam. You also see Mack Craig VK2NIV, he got his licence when he was 15 and he is giving Keira some pointers in radio operating.

OPERATING PORTABLE

PHOTO No. 8
Paul Phelan VK2NYO is 14. He likes to come along and help those getting started up at the amateur week-end activities. Paul himself started with 100 milliwatts, then 1 watt, 23 channels AM then 23 channels SSB, and now he's got an FT101E.

So what will happen on the October week-end? Come along and find out, we only have food and accommodation available for 160 people, so be quick. If you would like to set up your gear or just come along and help, if you're new to ralio or an oldtimer we would like to have you aboard.

It's only $17 for the lot. If you bring your family then it's only $10 for mum and $5 per kiddy.

To have everything prepared for you contact Bill or Mildred Newton, 64 Valley Road, Epping, NSW 2121, or phone Sydney on (02) 85 6321. ■

AMATEUR RADIO WEEK-END, 21st, 22nd, 23rd OCTOBER, AT KATOOMBA, NSW
A big get together of newcomers, prospective novices and licensees is being organised by the Wireless Institute of Aust. Education Service (NSW) incorporating the Youth Radio Service.

The fun starts at 8 p.m. on Friday, 21st October, 1978, and concludes on Sunday, 4 p.m., 23rd October. The venue is the St. Marie's Education Centre, just a few hundred metres from Katoomba railway station on the Sydney side of the Great Western Highway.

In July over 60 people from around NSW, Victoria and Queensland attended this fun study week-end. And now it is time to get set for the November novice exam or maybe you only just heard about the hobby and want to find out more — well then the July activities will give you an idea of what to expect. ■

ALIGNING YOUR MODIFIED CB TRANSCEIVER DEAD ON FREQUENCY
Some people who are using transceivers such as the Sideband Electronics SE502, which contain a set of four 16 MHz crystals to achieve operation on 28 MHz, and others who have obtained similar crystals in place of the existing set of four 14 MHz crystals have found that they have been 1 to 2 kHz off frequency.

This problem is easily solved by removing the four 22pF capacitors which are in series with the four 16 MHz crystals. You will now find that the trimmer capacitors which are in series with each of the 4 crystals will be able to zero your transceiver dead on to channel.

The fixed 22 pF capacitors are easiest removed from the printed circuit board by simply lifting one lead out of the board.

See also the articles "Modifying CB Transceivers to 10 Metres" and "More on Modifying 11 Metre Transceivers" published in AR for August and September 1978 issues.

Sam Voron VK2BVS ■

WIA CORRESPONDENCE

POSTAL AND TELECOMMUNICATIONS DEPARTMENT

GPO Box 5412CC,
Melbourne, Vic. 3001

Reference: RB4/11/30.

The Secretary,
Wireless Institute of Australia,
PO Box 150,
TOORAK, VIC. 3142.

Dear Sir,

Reference is made to your letter of 25 May, 1978, in which a request was made to extend the upper limit of the 80 metre Novice band from 3575 kHz to 3625 kHz.

Following Departmental investigations into the use of 80 metre band by Novice amateurs, the Department is pleased to advise that, effective forthwith the authorised 80 metre transmitting band for Novice amateurs will be 3525 to 3625 kHz.

The Department has taken the necessary steps to amend the licence accordingly and advise the relevant offices. Would you please give this matter publicity through the avenues available to the Institute.

Yours faithfully,

J. D. Williamson, for Secretary.

(The above letter was received at the Federal office on 8/8/78.) ■

AMATEUR SATELLITES

Bob Arnold VK3ZBB

A NEW SATELLITE

According to information in HR Report published by Ham Radio Magazine an Amateur Transponder could fly on Hughes' SYNCOM 4 in 1980 or 1981. The proposed satellite would be launched by Space Shuttle and placed in synchronous orbit over the 'Americas'.

AMSAT Canada has made proposals for this project and has already revitalised its organisation and elected officers and Directors, VE2DNM is President, VE3ACF Secretary and the mailing address Box 7306, Vanier, Ontario K1L8E4.

A little bird says that SYNCOM 4 could be located over the Pacific Ocean; if so, there is a possibility of communication to Australia and New Zealand if the antenna points in this direction!

Don't be confused, this proposal is not the well publicised Phase 3 OSCAR which is scheduled for eliptical orbit.

OSCAR 8

Communication on Mode J, 145.95 up, 435.15 down is obviously a tough assignment if the number of operators is any guide.

ZL1BDU is the most consistent and powerful signal in VK3 with occasional sorties by ZL3AAD, VK4TL, VK3ACH, VK5HI and yours truly. Mode A is consistently good with many stations working both local and DX stations. I wish local 10 metre stations would remember that 29.3 to 29.5 is allocated to satellite operations and avoid this segment, both morning and evening.

A NEW COUNTRY

Graham VK0GM at Casey Base, has been active on OSCAR 7 Modes A and B and OSCAR 8 Mode A.

It is particularly pleasing to have a new OSCAR country to work and we all thank Graham for his interest.

I am proud to have a QSL card confirming the first contact on AO7 Mode B between VK0 and VK3. Col VK7LZ made the first contact on Mode A. Graham's QSL Manager is Steven VK3OT who QSL's by return if a SASE is sent. Thanks also to Steve.

THE WANDERER RETURNS

Welcome to Les VK3BKF formerly VK3ZUR who has returned home after a two-year sojourn in England, and congratulations on the new call. Les worked OSCAR using his G call and was astounded at the activity in Europe. He is presently refurbishing his gear and should be communicating with us again by the time these notes are printed.

ANOTHER NEW COUNTRY

On a number of occasions FK8BB has been heard working many VK's and ZL's. Peter, who is located in Noumea, New Hebrides, gives an excellent signal on Mode A particularly on the early passes accessible to the Eastern States. Good work Peter, we hope to see you on Modes B and J in due course.

YET OTHERS

Stalwart OSCAR operator, Charlie VK3ACR, reports a scratchy and uncompleted contact with YB1CS in Indonesia. This was on a late pass in Melbourne on ascending node 220 and again on Mode A. Perhaps further contacts will be made before this report is published — keep trying Charlie. John, VK4TL, reports receiving a QSL from KG6PO confirming his contact last Summer. John has also heard YB1CS and has made contact with KR6 in Saipan on Mode A.

RUSSIAN OSCARS

A comment in AMSAT Newsletter indicates that the long-awaited Russian satellites should be launched this year and at a high altitude — how high and when remains to be seen, but we shall certainly be thrilled to have them in service.

BROADBAND OPERATIONS

One of the most prolific operators is Frank VK2ZI. From Broken Hill, Frank operates both OSCAR 7 and 8 on Modes A, B and J with excellent results. Many OSCAR operators appreciate Frank's cheery voice and persistence in completing contacts under difficult conditions.

APPRECIATION

Thanks to our Editor, Bruce, for agreeing to provide larger print for our notes. I hope the readers of this column will appreciate this improvement.

ORBIT PREDICTIONS — NOVEMBER, 1978

OSCAR 7				OSCAR 8			
		Time Long.				Time Long	
Date	Orbit	Z	°W	Date	Orbit	Z	°W
1	18120B	0144	86	1	3352A	0026	46
2	18132A	0044	71	2	3366A	0031	47
3	18145B	0138	85	3	3380A	0036	49
4	18157B	0037	69	4	3394J	0041	50
5	18170A	0132	83	5	3408J	0047	51
6	18182B	0031	68	6	3422A	0052	53
7	18195B	0125	81	7	3436A	0057	54
8	18207A	0025	66	8	3450A	0102	55
9	18220B	0119	80	9	3464A	0107	57
10	18232B	0018	65	10	3478A	0113	58
11	18245A	0112	78	11	3492J	0118	59
12	18257B	0012	63	12	3506J	0123	60
13	18270B	0106	77	13	3520A	0128	62
14	18282A	0005	62	14	3534A	0133	63
15	18295B	0100	75	15	3548A	0139	64
16	18308B	0154	89	16	3561A	0001	41
17	18320A	0053	74	17	3575A	0006	42
18	18333B	0148	87	18	3589J	0011	43
19	18345B	0047	72	19	3603J	0016	44
20	18358A	0141	86	20	3617A	0021	45
21	18370B	0041	71	21	3631A	0027	46
22	18383B	0135	84	22	3645A	0032	48
23	18395A	0034	69	23	3659A	0038	49
24	18408B	0129	83	24	3673A	0043	50
25	18420B	0028	67	25	3687J	0048	52
26	18433A	0122	81	26	3701J	0053	53
27	18445B	0022	66	27	3715A	0059	54
28	18458B	0116	79	28	3729A	0104	46
29	18470A	0015	64	29	3743A	0109	57
30	18483B	0109	78	30	3757A	0114	58

Times for OSCAR 8 have been corrected and based on the best information available as at the end of August. ■

OSCAR PHASE III PROGRESS REPORT

Jan King W3GEY

(Reprinted from AMSAT Newsletter)

Considerable progress has been made on the satellite and ground equipment; however, all of us are beginning to understand and appreciate the problems associated with developing a spacecraft some five times more complex than AMSAT-OSCAR 7. It's really quite a big project. The following is a summary of our progress and problems to date —

ESA/AMSAT AND ARIANE

On March 22, 1978, the European Space Agency (ESA) conducted a payload interface meeting to which AMSAT was invited. Since the meeting involved launch operations as well as integration of Phase III to the vehicle, it was mandatory that AMSAT send a US representative. The meeting was held in Toulouse, France, and Karl Meinzer DJ4ZC and myself attended. Many of the detailed interfaces to the ARIANE vehicle were discussed and many safety items relating to our kick motor (as could be expected) were reviewed in detail. I am happy to report that AMSAT's scheme for firing the motor and for "keeping it safe" while on the launch vehicle were accepted by ESA. This is important because other proposed schemes would have cost AMSAT several thousand extra dollars and would have increased the satellite weight by about 3 kg. ESA announced during the meeting that there is some chance that the launch could be advanced by one month, to November 1979. This would make an already tight development schedule even tighter.

During the visit to ESA, Karl and I were able to see a considerable amount of hardware. Perhaps the most impressive to me was a one-third scale model of the upper stage of the ARIANE rocket for launch test flight L02, including all the satellites. A complete scale model of Phase III was mounted at its appropriate place on the side of the larger mock-up. A message I came away with from this meeting is that ESA is not taking any chances. This vehicle is going on schedule and based on the things I saw, it's going to be reliable.

PHASE III GROUND STATIONS AND IPS

Ground operations for the Phase III launch are far more demanding than those needed for Phase II satellites. For this reason, ground equipment needs to be finished well ahead of the satellite. Since Randy Smith VE3SAT will be away on extended leave during the first part of the Phase III-A mission, John Fox W0LER and Ron Dunbar, W0PN together will be prime command and telemetry stations for Phase

III. Randy will join in upon his return. Located approximately 200 miles apart, Ron and John will have a truly complimentary system. Each ground station can back up the other. In fact, each can control the other's station from his own location via telephone or radio link. The Minnesota team expects to complete their ground station check-out by this fall and begin a one-year training period in preparation for the launch. Included will be several simulations for the launch day.

In order to facilitate writing software for the new spacecraft, Karl DJ4ZC has developed a high-level language for the RCA CDP-1082 processor and for the 8080s which will be used at the ground stations. This language, known as IPS (for a German acronym), is a structural language which has some similarities to a language known as FØRTH. Among its features, many of them unique, is the fact that the mnemonics themselves are bilingual. They may be changed from German to English (or vice versa) under software control. AMSAT hopes to make this language available to its members as part of a Phase III package which will also include printed-circuit boards needed for demodulating the engineering beacon telemetry and interfacing to a microprocessor, as well as needed documentation. We still have a way to go before this can be done.

Ron W0PN recently went to Germany (taking along and bringing back an 8080 system) to visit Karl and complete needed documentation to interface IPS to the 8080 system he and John W0LER are using. This visit also served to bring Ron up to speed on all the engineering details on the Phase III spacecraft.

AMSAT-OSCAR SPACECRAFT LABORATORY

On May 5, 1978, NASA and AMSAT signed a contract to jointly pursue a project that will allow AMSAT to demonstrate to the public how amateurs build spacecraft (specifically Phase III). Under the terms of the contract, AMSAT and NASA will jointly fund a facility at the Goddard Space Flight Center to be used by AMSAT to construct our new Phase III satellites. In return, AMSAT will demonstrate to NASA visitors our approach to low-cost aerospace construction. The facility, about 700 square feet in area, includes an integration area, an assembly laboratory, a much-needed storage area for high reliability components, and an office area. The building should be ready in August and will be dedicated at our Annual Meeting on October 14th.

PHASE III SPACECRAFT

(A) **Structure:**

More than any other part of the spacecraft, the structure has undergone an evolutionary process. After a number of preliminary concepts were discarded and two different models were built, a structure known as the ETU (Engineering Test Unit) was built in West Germany. The structure was then sent to the US where a "dummy" kick motor and wooden modules were installed to simulate the flight spacecraft. In December of 1977 the ETU was sent to the Cal. Tech. Jet Propulsion Lab. in California where it was subjected to vibration qualification tests at levels specified for the ARIANE vehicle. While the structure passed the tests successfully, a number of changes were suggested by the test results. These changes are now being incorporated into the final design and materials are being ordered in preparation for assembly of the flight structures (two will be built). In the meantime, the ETU was returned to AMSAT-DL for inclusion of engineering model electronic modules. The completed ETU will then be sent to ESA for further testing starting in September of this year.

(B) **IHU:**

Of the electronic system in Phase III, the *Integrated Housekeeping Unit* (IHU) is the most tested and ready for flight. The IHU which contains the COSMAC microprocessor has been tested at the prototype level for many thousands of hours. The command detector and telemetry encoder schemes have been tested in prototypes with CDP-1801 COSMAC while located at a remote repeater site (60 miles distant from the control site). The results (in terms of bit error rate) are extremely close to the theoretically predicted performance. With the ever-improving technology in CMOS devices, it now will be possible to fly 16K of RAM memory in the flight IHU instead of the originally-planned 2K of memory. Features have been added to the IHU to allow range measurements to be made via the command and telemetry links, and to allow retransmission of the results of range measurements from one command station to another, again via the IHU.

(C) **Power Sub-system:**

AMSAT is presently working with NASA and NOAA to obtain 48 battery cells remaining from the ITOS satellite program (enough cells for several spacecraft). In addition, some 10,000 solar cells may also be obtained from the same source. While the cost of the cells is itself high, even if the cells are donated the cost of the cover slips and fabrication will still amount to approximately $10 per cell. (Those members who sponsored solar cells take note — at $10 per cell (assembled) it's a bargain!) We should know the prospects of obtaining this leftover hardware by the time you read this.

The battery charge regulator (BCR) for Phase III is very similar to that flying in AMSAT-OSCAR 8. Although A-O-8's BCR is less sophisticated than that for Phase III, it verifies the concept of converting power from 28 volt solar arrays to a 12-14 volt battery system which is the same for both satellites. In Phase III, the BCR and all other DC-to-DC converters will be contained in a single power module.

(D) **Attitude Control Sub-system:**

The concept that makes Phase III so different from previous satellites is that it has an "active" attitude control system. This difference is quite profound. While former satellites were mere "boxes" with electronics inside, this spacecraft is a robot which can be instructed to assume any attitude we choose in space under remote control and it can tell us when it gets there. We have one constraint with our robot though: It wants to spin about one axis. In fact, with the IHU, we may store nearly any number of motions of the spin axis for execution at a later time or under a certain set of conditions.

The components for this system have now all been selected. One "eye" of the robot is similar to a sun sensor used previously on another NASA mission. The sensor tells the spacecraft where the sun is in relation to the spin axis and when the sun passes by one of the three arrays. The second "eye" is an earth sensor which gives the relationship of the earth to the satellite at various points in the orbit. The earth sensor is being developed by DJ4ZC with components provided by Leitz, a West German optics manufacturer. The force applied by the satellite to cause it to attain the proper attitude is via interaction of the earth's magnetic field with a large magnetic torqueing coil network aboard the spacecraft. Most of the electronics required in this subsystem is to interface these components with the IHU. Many of the logic operations which were once handled by discrete logic controllers can now be performed by the software. A prototype of the torquer coil assembly and the earth sensor are now being assembled in West Germany.

The remaining component in the attitude control system is a fluid damping system; it consists of small tubes partially filled with a viscous fluid, and will stop any nutation (wobble) of the spin axis in a matter of seconds. Prototypes of these tubes have been built and tested and are being incorporated into the ETU.

(E) **Transponder:**

The 50-watt version of the 70 cm to 2m transponder is still in breadboard at AMSAT-DL. Werner Haas DJ5KQ has completed the design of the front-end and IF stages and is working on the power amplifier and modulator stages. On flight-quality transponder is expected to be completed by early fall. Unfortunately, due to schedule problems, it presently appears unlikely that the first Phase III spacecraft (Phase III-A) will carry both frequency combinations as had originally been hoped for. The 70 cm-to-2m transponder was chosen for development first because it provides better link performance. The 2304 MHz S-Band beacon is likely to be dropped for the same reason and because no allocation can be assured until the 1979 World Administrative Radio Conference.

One particularly continuing problem associated with the transponder has been solved. Until recently it was not possible to find a good quality crystal filter with a bandwidth of 150 kHz. JAMSAT members have approached the Japanese firm which provided the filter for the A-O-8 Mode J transponder regarding this problem and they can provide a 150-kHz bandwidth filter to AMSAT specifications.

(F) **Antenna Sub-system:**

The antenna system is indeed a very critical system to proper Phase III performance and more work needs to be done in this area. A computer model for predicting antenna patterns for Phase III has been developed by Tom Clark W3IWI (ex WA3LND). With this model, it was possible to determine that one antenna system at the end of the arms could not be used on two metres as well as 70 cm. It is now felt that a separate 70 cm antenna will be placed along the spin axis of the spacecraft on the end opposite the motor. A one-third scale model of Phase III was recently constructed by Bill Hodzik WA2UDT so that detailed antenna pattern measurements could be made. These measurements are planned to take place in the next few months at NASA so that flight antennas may be built from this data.

SUMMARY

To date, I feel we have made reasonable progress on Phase III, particularly considering the many other activities in which AMSAT has been involved. We do, however, have a long way to go and not much time is left. I would like to personally thank all those who have so generously donated to the Phase III effort and those who have offered their technical help. For those in the latter category, please be patient. Very little of the design information for "production" of the flight electronics has been released by AMSAT-DL. Much of this documentation is expected very soon and we will try to give some work to everyone. ■

THE INTRUDER WATCH COMES OF AGE IN GREAT BRITAIN

Alf Chandler VK3LC
Federal Intruder Watch Co-ordinator

The following is mostly a direct quotation from an article in "Radio Communication" by Stan Cook G5XB and Colin Thomas G3PSM Intruder Watch Co-ordinators in Great Britain. The theme of the article is relevant in Australia also.

"This year marks the 21st anniversary of the RSGB Intruder Watch system. With a little over a year to go before the world administrations and telecommunication organizations find themselves plunging into the next World Administrative Radio Conference, it is perhaps appropriate to report in general on the International Amateur Radio Union Monitoring System and, in particular, the part played by the RSGB IW.

Due chiefly to the energy and foresight of early pioneers, the foundations laid down by the RSGB in 1957 have led to the establishment of a world-wide network of amateur band monitoring stations under the direction of the IARU, bringing together some 30 or more IARU member societies and forging links with nearly as many government regulatory administrations.

Since 1972 G3PSM has taken the responsibility of co-ordinating the world-wide activity of the IARU Monitoring System.

A measure of the work involved in this last operation can be judged by the monthly inflow of intruder reports which now average 2,500.

These reports are cross-checked, integrated, summarized and published in the Intruder Monthly Summary, a document of some 20 pages, which is distributed to contributing monitoring stations and societies, and to official bodies (including the International Telecommunication Union in Geneva).

In any monitoring operation, accessibility of information and feedback of results is of prime importance. To this end, once monitoring stations are established they are supplied with a copy of the general procedures and instructions in order to regularize reports as regards classification of emissions, traffic description and other salient features of intruding signals. Although the sheer size of the task of logging intrusions of broadcasting stations in the 7 MHz and harmonically related segments is in itself a problem, an even greater one is posed by the proliferation of binary data and teleprinter communications throughout the high frequency spectrum.

The 14 and 21 MHz amateur bands are apparently well known as "happy hunting grounds" for diplomatic, military and commercial systems displaced by interference from their normal operating channels. As a result, QRM from these sources, being of a transitory nature, but nonetheless troublesome, is difficult to identify and even more difficult to trace and make the subject of a meaningful official complaint. However, in recent months, the RSGB Intruder Watch has achieved a measure of success in identifying some of the simpler systems by a kind of delayed action.

Several watchers possessing cassette recording apparatus have co-operated in this venture by sending with their monthly logs a tape of the aggregate signals, i.e. mark and space tones of the intruders normally logged as "unidentified printer". These, when up-converted from audio to radio frequency by the simple expedient of feeding the tone in question into a low level A3J exciter, are then tuned on a conventional narrow band communication receiver and offered to a time frequency spectral display and, eventually to a hard copy printer. Offenders, hitherto unidentified, who have responded to this treatment include examples of simple FSK (F1 U5) at 50 and 75 bauds, four frequency diplex (F5 U5 and U7) and individual components of independent sideband frequency-division complexes (A7b). In general an intruder is not reported to the Home Office unless the incident is logged and confirmed on two occasions at the same time of day and in two different geographical locations.

This is why the Intruder Watch needs more monitoring stations to produce the necessary evidence to initiate prompt action.

With WARC 79 imminent the assistance of enthusiasts is needed to preserve our exclusive amateur allocations."

Thus, from the above can be seen the difficulties and the aspirations of the Intruder Watch personnel in the UK.

The Intruder Watch in Australia is only 11 years old, but it will be interesting to see how we shape up when we *"Come of Age"*. ■

TECHNICAL CORRESPONDENCE

K. W. Gooley VK2BGZ
2/38 Waters Rd., Cremorne 2090
2/7/78

FT101 DIGITAL READOUT

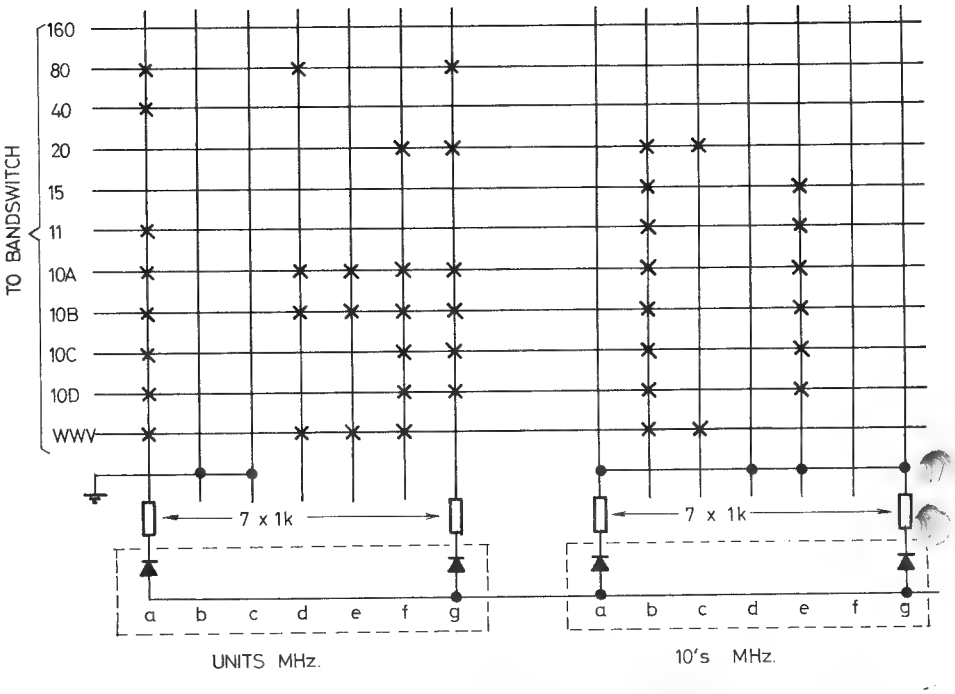
The Editor,

Dear Sir,

Would you please publish the following corrections to Fig. 6 of my outside "Digital Readout for the FT101" of January 1978 issue.

Thank you.

Yours faithfully,
K. W. Gooley VK2BGZ ■



FT101 Digital Readout Corrections — VK2BGZ

The Editor,

Dear Sir,

The following errata apply to the article "Delayed braking action for rotators", page 27, August 1978 AR.

First paragraph: "The Ham II control unit does not have . . ." should read **"The Ham II control unit does have . . ."**

Second paragraph: "When an undeveloped stop is required . . ." should read **"When an undelayed stop is required . . ."**

Geoff Wilson VK3AMK ■

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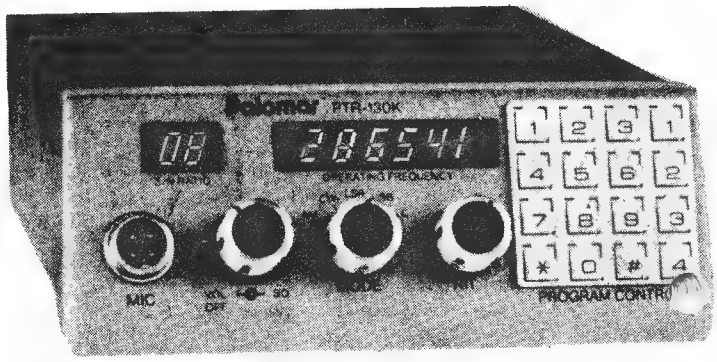
Star Features:

- Complete Coverage 1.8-30 MHz.
- Receive Coverage 100 kHz-30 MHz.
- True 100 Hz Frequency Synthesizer with 5 kHz Reference (does NOT use D-A Converter as some amateur rigs claiming 100 Hz synthesis).
- 6 Digit Frequency Readout.
- Digital Readout of Signal Strength in dB Above the Noise Floor of Receiver.
- RF Compressor Effectively Increases Transmitter Output by 12 dB (16 times).
- Approx. 20 watts output.



- Modes: LSB, USB, CW, AM, FM.
- Superior Receive Selectivity — Typical Shape Factor 3 dB/60 dB 1/.25 (2 Cascaded Collins Mechanical Filters).
- Diode Ring Mixer with Broadband Load to Optimum Intermodulation Perperformance.
- 400 Hz CW Filter.
- Size: 6½" x 2½" x 8".
- 58 ICs, including 7 LSI Circuits.
- Watch this space next month for price.

P.O.A.

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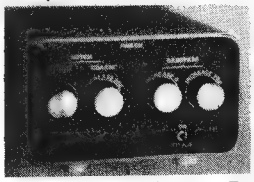
Here is the Receiver Audio Active Filter that makes all others obsolete. The Electronic Research Corporation America Model SL-55 Audio Active Filter adds unequalled versatility in receiver audio processing for SSB and CW. This filter was designed, produced and made available to the amateur community only after painstaking research and field testing of its effectiveness in minimizing QRM. Check these features:

Continuously tunable bandpass filter (not lowpass) so that the passband may be positioned anywhere from 200 to 1400 Hz. 3 dB bandwidth is continuously adjustable from 14 to greater than 2100 Hz (20 dB bandwidth from 140 to 2100 Hz).
Audio input and output impedance is eight ohms with one watt output capability.
Dimensions: 5.5 x 7.5 x 3.5 inches.
Available in grey to match FT101E.



$129

Positioning of simultaneous notch filter is continuously variable from 300 to 1400 Hz with FINE and COARSE position controls. Notch depth is fixed at nominally 30 dB. Notch tuning is independent of bandpass tuning and may be completely disabled.
Bypass switch restores the receiver audio output path to its original configuration.
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VK3CA

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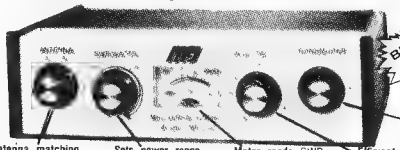

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Antenna matching capacitor 208 pf 1000 volt spacing

Sets power range, 300 and 30 watts Pull for SWR

Meter reads SWR and RF watts in 2 ranges.

Efficient airwound inductor gives more watts out and less losses.

Transmitter matching capacitor 208 pf 1000 volt spacing

Only MFJ gives you this MFJ 941 Versa Tuner II with all these features at this price

A SWR and dual range wattmeter (300 and 30 watts full scale) lets you measure RF power output for simplified tuning

An antenna switch lets you select 2 coax fed antennas, random wire or balance line, and tuner bypass

A new efficient airwound inductor (12 position) gives you less losses than a tapped toroid for more watts out

A 1:4 balun for balance lines, 1000 volt capacitor spacing. Mounting brackets for mobile installations (not shown)

With the NEW MFJ Versa Tuner II you can run your full transceiver power output — up to 300 watts RF power output — and match your transmitter to **any** feedline from 160 thru 10 Meters whether you have coax cable, balance line or random wire

You can tune out the SWR on your dipole, inverted vee, random wire vertical mobile whip beam, quad, or whatever you have

You can even operate all bands with just one existing antenna. No need to put up separate antennas for each band

Increase the usable bandwidth of your mobile whip by tuning out the SWR **from inside your car.** Works great with all solid state rigs (like the Atlas) and with a tube type rigs

It travels well, too. Its ultra compact size 5x2x6 inches fits easily in a small corner of your suitcase

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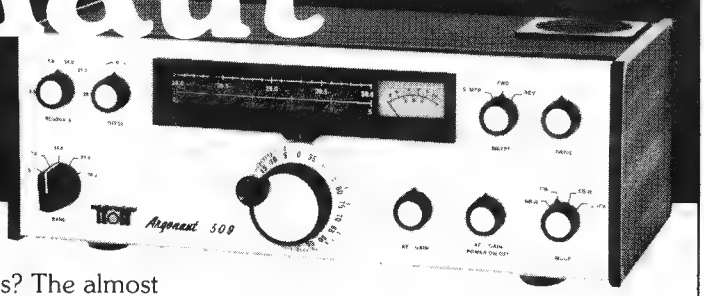

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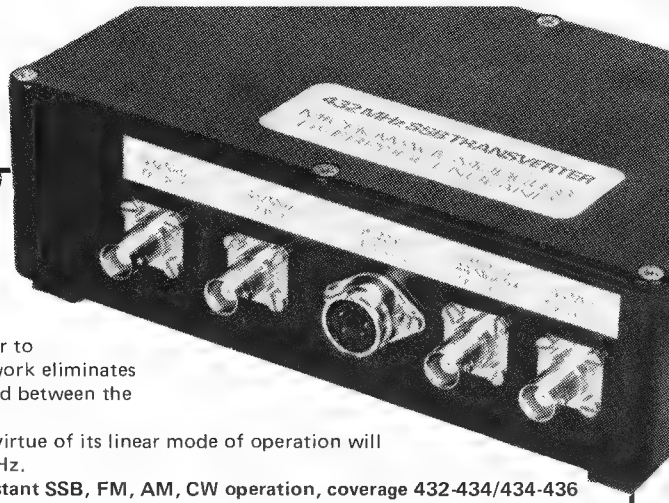

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UTILIZING an IF of 144MHz * 10 WATTS DRIVE of ½ WATT * VOX
OPERATED, TWO SELECTABLE RANGES
FEATURES EXTENDED COVERAGE FOR OSCAR 8

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Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation, coverage 432-434/434-436 in two ranges.

FEATURES: High quality double-sided glass fibre printed board * Highly stable zener controlled oscillator stages * PIN diode aerial changeover relay with less than 0.2 dB through loss * Extremely low noise receive converter, typical 3 dB * Separate receive converter output gives independent receiver facility * Built in Automatic RF VOX with override facility * Built in 10 watt 144 MHz termination, selectable attenuator for ½ watt * Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output

MODEL MMT432/144S Price $295

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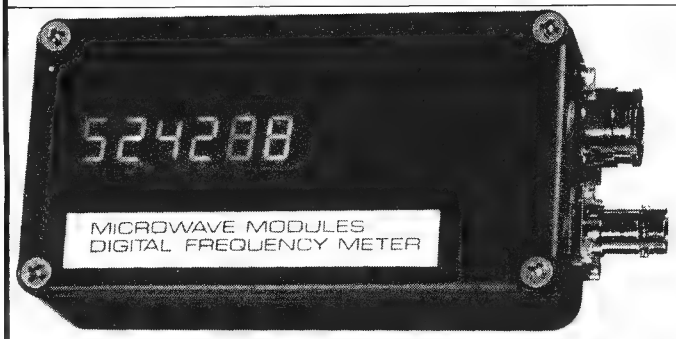
Second Crystal Oscillator gives two ranges: Low 432 – 434 MHz – High 434 – 436 MHz. Programming available to either Transmit/Receive both Low, both High, or a mixture of the two. Adjustable Drive Level is now provided by an input potentiometer. Optional RF VOX. Power Output 10 watts minimum * 28 MHz IF * Drive 1 mW to 500 mW * Aerial Changeover by PIN diode switch * Modern Microstrip Techniques * Power requirements 12 volt nominal at 150 mA 2.5 amp. peak * Case size 187 x 120 x 53 cm * Spare 432 input socket.

MODEL MMT 432/28S Price: $245 **MODEL MMT 144/28 Price: $185**



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SPECIFICATION:

Digit Height	10 mm
Display Width	45 mm
Case Size	111 x 60 x 27 mm
Frequency Ranges	0.45 - 50 MHz, 50 - 500 MHz Better than 50 mV RMS over 0.45 - 50 MHz. Better than 200 mV RMS over 50 - 500 MHz
Input Connector	50 ohm BNC
Input Impedence	200 ohm approximately
Power Connector	5 pin 270 deg. locking DIN socket (supplied with plug).
Power Requirements	11 - 15 volts DC at 300 mA approximately

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DUAL RANGE 432 – 434 MHz & 434 – 436 MHz CONVERTER
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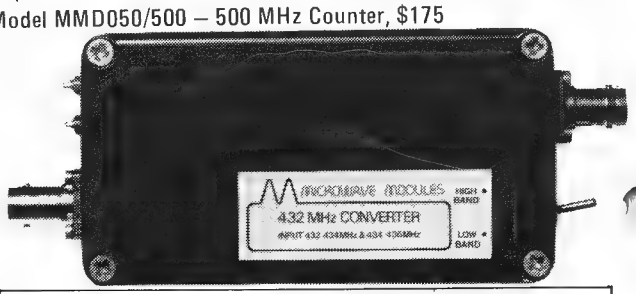
SPECIFICATIONS:

Input frequency ranges:	432-434 MHz (low) 434-436 MHz (high)
I.F. output frequency:	28-30 MHz or 144.146 MHz
Typical gain:	30dB
Noise figure:	3dB Maximum
D.C. Power requirements:	11-13.8 volts 12.5V nominal
Current consumption:	50 mA Maximum



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Featuring 24 MHz local oscillator output for transverter use:

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I.F. Output Frequency :	20-30 MHz
Typical Gain:	30 dB
Noise Figure:	2.5 dB
Typical Image rejectoin:	65 dB

Crystal Oscillator Frequency: 24 MHz
Power requirements: 12 volt ± 25% at 35 mA.

MODEL MMC52/28LO Price: $49.00

1296 MHz CONVERTER
Mircostripline, Schottky diode mixer.
IF: 28-30 MHz or 144-146 MHz
Noise figure: typ. 8.5 dB
Overall gain 25 dB **Price: $65.00**

CONVERTERS
PACK & POST $2.00

144 MHz MOSFET CONVERTER
Noise figure: typ. 2.8 dB.
Overall gain: typ. 30 dB.
IF: 28-30 MHz. 9-15 V 20 mA.
Price: $45.00

VARACTOR TRIPLER 432/1296
Max. input at 432 MHz. 24 W (FM, CW) - 12 W (AM)
Max output at 1296 MHz: 14 W
Price: $74.00

AMATEUR ELECTONIC IMPORTS IS THE EXCLUSIVE AUSTRALIAN DISTRIBUTORS FOR THESE PRECISION BRITISH MADE UNITS FROM MICROWAVE MODULES LTD.

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Amateur Electronic Imports
P.O. BOX 160, KOGARAH. N.S.W. 2217
TELEPHONE: (02) 547-1467
CABLE: "AMATEURIMPORT, SYDNEY"

NEW

MML 432/100, 100 WATT 432 MHz LINEAR POWER AMPLIFIER

FEATURES

* **100watts minimum output 10dB minimum gain**
* **Fully protected against poor load VSWR, overheating and excessive or reverse supply rails.**
* **Equipped with RF VOX and manual override**
* **Supplied with power lead and all connectors**

Frequency bandwidth: 435 MHz ± 15 MHz @ – 1 dB
Power requirements: 12.5 V nominal @ 20 amps for 100 output. 13.8 V maximum.
RF Input connector : 50 ohm BNC
RF Output connector: 50 ohm 'N' type
Weight: 4kg (8lb. 13 oz.)
Overall Size: 315 x 142 x 105 mm. 12 3/8 x 5 5/8 x 4 1/8")

SPECIFICATION:

Power Gain	:	10 dB minimum
Power output	:	100 watts RMS output @ 1 dB compression
Power input	:	10 watts nominal for 100 watts output

PRICE $395

DESCRIPTION

This solid state 432 MHz linear power amplifier, MML432/100, is intended for use with any existing 432 MHz equipment having an output power of 10 watts. When used in conjunction with such a drive source this linear amplifier will provide a power output of 100 watts minimum.

The inclusion of the latest state of the art power transistors (each of the final transistors being rated at 145 W dissipation), guarantees a highly reliable and ultra-linear unit which is suitable for all modes of operation. (SSB, FM, AM, CW, RTTY and TV).

The amplifier utilises recently developped matching techniques which allow safe operation even when improperly subjected simultaneously to 50% overdrive and a supply voltage of 15 V.

However, as a further safeguard against damage to the final transistors, the following protection circuitry has been included to shutdown the unit in cases of poor load VSWR, overheating, and excessive or reverse supply rails.

(i) HIGH VSWR: The amplifier will automatically shutdown into the straight through mode should the sensing circuitry detect a load VSWR of worse than 2.5: 1 at the antenna socket.

The mode of shutdown will be indicated by the illumination of an LED status light on the front panel.

The sensing circuitry will test for an improvement in the load VSWR every 8 seconds. When the load VSWR returns to less than 2.5:1 the sensing circuitry will allow the unit to return to normal operation.

(ii) THERMAL: Should the heatsink temperature reach 65°C or more, the amplifier will automatically shutdown into the straight through mode, until the heatsink falls well below this temperature.

This mode of shutdown will be indicated by the illumination of an LED status light on the front panel.

(iii) OVERVOLTAGE AND REVERSE POLARITY: The incorporation of a crowbar circuit protects the transistors against reverse polarity or an excessive supply voltage. This will automatically shutdown the unit should the supply voltage exceed 15 V or should the supply be reversed.

By means of an internal RF vox circuit the linear will automatically switch onto transmit when 432 MHz drive is applied to the input socket. However, this facility may be overridden by the application of an earth to the phono socket located on the rear panel. This may be achieved by connection to the transceiver PTT switching line.

An integrated circuit network provides a well-regulated bias supply for the final transistors, and each transistor is individually thermally tracked against ambient temperature variation and operational temperature rise.

All RF circuitry is constructed on high quality double-sided TEFLON PC board and the use of broadband stripline techniques gives the unit a bandwidth of 420-450 MHz, without the need to re-tune.

The unit is housed in a highly durable, black steel case, RF input and output sockets are located on the rear panel, together with the 12 volt supply fuse, and the push to talk line phono socket. The unit is supplied fitted with a 12 V supply cable, plugs for both input and output connectors, a phono plug for the PTT line, and a spare fuse.

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CABLE: "AMATEURIMPORT, SYDNEY"

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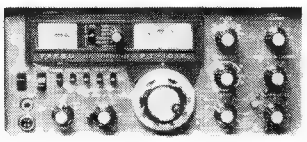
CHIRNSIDE ELECTRONICS THE BEST ON PRICE AND SERVICE SAVE $$$

DIRECTOR: FRED SWART
VK3NBI

YAESU

KENWOOD



YAESU

P.O.A.

FT-901DM.160-10M Transceiver.
FT-101E. 160-10M Transceiver.
FT-301. 160-10M Transceiver.
FT-301S. 160-10M Transceiver.VOX Cal.&AM.
FT-301D. 160-10M Digital Transceiver.
FT-7. 80-10M Transceiver.
FP-4. Matching Power Supply.
FRG-7. General Coverage Receiver.
FRG-7000. Digital General Coverage Receiver.
FT-227R. 2m. Mobile Transceiver.
FT-225RDM. 2M. ALL Mode Transceiver.
FR-101D. Receiver.
FR-101DD. Digital Receiver.
FL-2100B. 1200 Watt Linear Amplifier.
FL-110. 200 Watt DC input Linear Amplifier.
YO-100. Monitorscope for FT-101E.
YO-101. Monitorscope for FT-101E.new model.
YO-301. Monitorscope for FT-301 series.
FP-301. Matching Power Supply for FT-301 series.
FP-301D. Digital Power Supply.
YP-150. Dummy Load-Watt Meter.
YD-844. Desk Mic.
QTR-24. 24 hr.World Clock.
FV-101.. Matching VFO for FT-101E.
FV-301 Matching VFO for FT-301 Series.
FC-301 Antenna Coupler inc.SWR and PWR Meters.
YC-500S. 500 Mhz. Frequency Counter.
YC-500J. 500 Mhz. Frequency Counter.
FL-101. Transmitter.Companion unit for FR-101.
FTV-650B. 6M.Transverter.
FTV-250. 2M.Transverter.
R-301. Relay box for FT-301 to FL-2100B.
SP-101. Matching External Speakers for FT-101E,FR-101,FRG-7,FT-301.
YC-601. Digital readout Adaptor for FT-101E.
YD-846. Hand mic.
FT-625D. 6M.ALL Mode Transceiver.
FT-225R. All Mode Transceiver.Analog Dial.
Optional Crystal Filters.

FT-227R. 2m.

$369

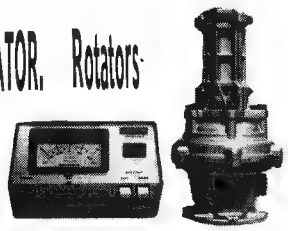
QTR-24.

$33.

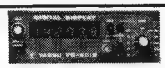
YD-148

MORSE KEYS.
HK-707. On standard base with dust cover
HK-710. De Luxe heavy duty morse key.
TC-701. Practice keyer with built in Osc.
EKM-1A. Morse Practice Osc.

EMOTATOR. Rotators



103LBX. Medium Duty.
502CXX. Heavy Duty.
1102MXX. Extra Heavy Duty.
1103MXX.
1211 Mast Clamp for 103LBX.
1213 Mast Clamp for 502CXX.
1215 Mast Clamp for 1102-3MXX.
300 Mast Stay Bearing.
VCTF-7. 7 Core Cable.per Metre.
VCTF-6. 6 Core Cable.per Metre.



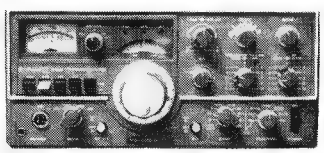
YC-601. Digital readout Adaptor for FT-101E $279.

FT-225RDM. 2M. ALL Mode

$995

INCLUDES FREQ. MEMORY UNIT

GIVE US A CALL NOW!



TS-520S. P.O.A.

KENWOOD

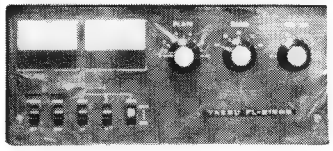
KENWOOD Equipment available ex-stock

TS-520S HF Transceiver ac only
TS-820S HF Digital Transceiver ac only.
SP-520 Matching speaker for TS-520S.
SP-820 Matching speaker for TS-820S inc.filters.
VFO-820 Matching VFO for TS-820S.
VFO-520 Matching VFO for TS-520S.
SM-220 Monitor Scope Kenwood series.
DG-5 Digital Display for TS-520S.
DS-1A DC Converter TS-520-820.
AT-200 Matching Antenna Tuner Power meter including antenna switch.
Optional crystal filters.
MC-35S Hand Mike HI Z.
MC-50 Base Mike HI and LO Z.

All Equipment pre-sales checked and wired for 240v ac operation!!!!!

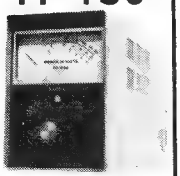
MISC.
SWR-200. Large dual meter SWR.
FS-600A. Peak Reading Wattmeter SWR Meter.
ME-11X. Twin SWR-PWR Meter. 3.5-150Mhz.
RS-101. Small single SWR Meter.
Western 5 Pos.Coax Switch.
Diawa 2 Pos. Coax Switch.
TWS-120. 2 Pos.Slide Coax Switch.
VS-1. Mini Mic. Compressor.
VS-BN. Ferrite Balun 2Kw.for Beams and Doblets.
TV-42. Drake 3 Section Low Pass Filter.1.5Kw.
Multi-band dipole traps and centre insulator 80-10M.
Porcelain Egg Insulators.
Wide Range of Coax Cable and Connectors in stock.
Yaesu Gutter Mount Mobile Whips.Complete set 80-10MInc. 2M.
Asahi AS-303. HF Mobile antenna setINC. ball mount and spring.
AS-NK Matching SS Bumper Mount for AS-303.

YAESU FL-2100B



FEW ONLY. **$519**

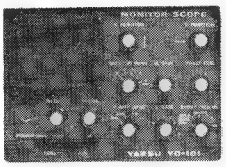
YP-150



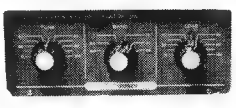
$108.

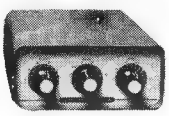
YAESU YO-101

Monitorscope for FT-101E.



NEW MODEL. $379.

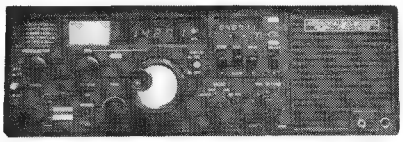




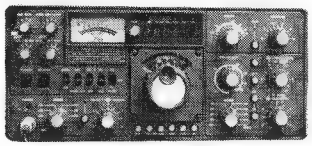
ANTENNA COUPLERS.

HC-75. Tokyo Hy-Power Labs.Transmatch 75W PEP.
HC-250. Tokyo Hy-Power Labs.Transmatch 250W PEP.
HC-500. Tokyo Hy-Power Labs.Transmatch 500W PEP.inc.160M.
HC-2500. Tokyo Hy-Power Labs.Transmatch 2.5Kw. PEP.
AT-200. Kenwood. 200 Watts.
FC-301. Yaesu.Inc.SWR and PWR Meters.

YAESU FRG-7000 . . . $679.



YAESU FT-901DM



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HIDAKA.
Antennas.
VS-33. 3el.Triband Beam 20-15-10M.Inc.Balun.
VS-22. 3el.Duoband Beam 15-10M Inc. Balun.
VS-41-80KR. 80-10M Trapped Vertical.
VS-RG. Radial Kit for VS-41-KR.

HY-GAIN ANTENNAS.

18-AVT 80-10 M Vertical.
CB-5 Select 11-10 M Beam.
TH-3 Mk.3 20-15-10 M Beam.
TH-3 Jr. 20-15-10 M Beam.
TH-6 DXX 20-15-10 M 6 EL.
HI-QUAD 3 El.Quad 20-15-10 M.

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PHONE (03)726 7353

All prices include Sales Tax. Freight and Insurance extra.
Prices and specifications are subject to change without notice.

2 METRE REPEATERS

The list below is published from material kindly supplied by the WIA NSW Repeater Committee and is dated August 1978.

AUSTRALIAN REPEATERS

Ch. No.	Frequency	Call	Location	Remarks
AUSTRALIAN CAPITAL TERRITORY				
46/6	146.300/.900	VK2RAC	Canberra City	Operatoinal
47/7	.350/.950	VK2RGI	Mt. Ginini	Op. late 78
NEW SOUTH WALES				
602	146.025/.625	VK2RYY	RTTY Maitland	Op. late 78
41/1	.050/.650	VK2RDX	Mt. Binda via Oberon	Op. late 78
607	.075/.675	VK2RTY	RTTY Sydney	Prov. & Plan.
42/2	.100/.700	VK2RPM	Port Maquarie	Operational
42/2	.100/.700	VK2RAO	Orange	Operational
42/2	.100/.700	VK2RMU	Ulladulla/Milton	Operational
612	not allocated			
43/3	146.150/.750	VK2RAG	Gosford/Wyong	Operational
43/3	.150/.750	VK2RWG	Wagga	Operational
43/3	.150/.750	VK2R	Bega	Prov. & U.C.
617	not allocated			
44/4	146.200/.800	VK2RLE	Heathcote	Operational
44/4	.200/.800	VK2RIC	Lismore	Operational
622	not allocated			
45/5	146.250/.850	VK2RGF	Griffith	Operational
45/5	.250/.850	VK2RAW	Woolongong	Operational
45/5	.250/.850	VK2RAB	Gunnedah	Operational
627	.275/.875	VK2RMB	Manly	U.C. late 78
46/6	.300/.900	VK2RAN	Newcastle	Operational
632	.325/.925	VK2R	Gladesville	U.C. late 78
47/7	.350/.950	VK2RMI	Moree	Testing
637	not allocated			
48/8	.400/147.00	VK2RWI	Dural	Operational
702	147.025/.625	Test Ch.		
9	.050/.650	VK2RBM	Blue Mts./Medlow Bath	Op'tional
707	not allocated			
10	147.100/.700	VK2RWC	Westlakes/Watigan Mts.	,,
712	not allocated			
11	147.150/.750	VK2R	City of Sydney	Provisional
717				
12	147.200/.800	VKR2	Upper Hunter	Provisional
722	.225/.825	VK2RST	Hornsby/SSTV	U.C.
13	147.250/.850	VK2RHD	Hornsby	Testing
727	not allocated			
14		VK2R	Nat. ATV Liaison	Provisional
732	not allocated			
15	146.350/.950	VK2RHR	High Rang Mittagong	Late 78
15	.350/.950	VK2R	Forster	Planned

VICTORIA

42/2	146.100/.700	VK3RML	Mt. Dandenong	Operational
43/3	.150/.750	VK3RBA	Ballarat	Operational
44/4	.200/.800	VK3RAM	Bendigo	Operational
44/4	.200/.800	VK3RLV	Latrobe Valley	Operational
45/5	.250/.850	VK3RMM	Mt. Macedon	Testing
46/6	.300/.900	VK3RSH	Swan Hill	Operational
46/6	.300/.900	VK3REG	East Gippsland	Operational
47/7	.350/.950	VK3RWZ	Grampians	Operational
48/8	.400/147.00	VKARMA	Mildura	Operational
48/8	.400/147.00	VK3RGL	Geelong	Operational
48/8	.400/147.00	VK3RWE	Wodonga	Operational

QUEENSLAND

42/2	146.100/.700	VK4RGC	Gold Coast	Operational
42/2	.100/.700	VK4RAT	Townsville	Operational
42/2	.100/.700	VK4RAP	Rockhampton	Operational
44/4	.200/.800	VK4RDD	Toowoomba	Operational
44/4	.200/.800	VK4RGU	Bundaberg	Operational
46/6	.300/.900	VK4RAI	Ipswich	Operational
48/8	.400/147.00	VK4RBN	Brisbane	Operational

SOUTH AUSTRALIA

42/2	146.100/.700	VK5RMN	Port Pirie	Operational
45/5	.250/.825	VK5RHO	North Adelaide	Operational
46/6	.300/.900	VK5RMG	Mt. Gambier	Operational
48/8	.400/147.00	VK5RAD	Adelaide	Operational

WESTERN AUSTRALIA

42/2	146.100/.700	VK6RAP	Perth Hills	Operational
44/4	.200/.800	VK6RAH	Perth City	Operational
44/4	.200/.800	VK6RAA	Albany	Operational
46/6	.300/.900	VK6RBY	Bunbury	Operational
48/8	.400/147.00	VK6RAW	Wagin	Operational
48/8	.400/147.00	VK6RAK	Kalgoorlie	Operational

TASMANIA

42/2	146.100/.700	VK7RHT	Mt.Wellington/Hobart	Operational
43/3	.150/.750	VK7RNW	NW Coast/Ulverstone	Operational
48/8	.400/147.00	VK7RAA	NE Coast/Mt. Barrow	Operational

COMMONLY USED SIMPLEX CHANNELS

Ch. 40—146.00 Ch. 49—146.45 Ch. 50—146.50 Ch. 51—146.55
Ch. 52—146.60 Ch. 68—146.40 Ch. 69—147.45 Ch. 70—147.50
Ch. 71—147.55 Ch. 72—146.60

EXPLANATION OF STATUS INDICATORS

(a) Provisional — Allocation subject to confirmation when more detail is available.
(b) Planned — Repeater at planning stage.
(c) U.C. — Repeater under Construction..
(d) Testing — Indicates Repeater under trial operational period on a part or full time basis.

The channel numbering system varies from State to State: Two systems are shown in prime channels i.e. 1-15 in N.S.W. and 41-48 in Victoria. The numbers shown in the 25 kHz splits i.e. three digit numbers are at this time suggestions only. ■

RETURN OF THE SIX METRE BAND TO AMATEURS — PART 1

Eric Jamieson VK5LP

About 12 months ago I asked interested amateur operators to write to me setting out their views on any moves likely to be made for the return of the 50 to 52 MHz segment of the international six metre band to the Australian Amateur Service. Typically some replied straight away, some a little later, others wrote after further prodding, many did not write at all. This of course is a standard amateur response, and not unexpected, but I was surprised at some of the missing call signs. However, life is full of surprises — like the morning a few months ago when you awoke to the news of the likely escalation of the use of Channel 5A (right alongside our 2 metre band) in Australia. That's another matter, and I may be having more to say on that later.

HISTORICAL AND PREVIOUS RECOMMENDATIONS

Perhaps you should be reminded, a lot of our problems, if not all, came with the advent of television, first with a 10 channel system and later 13 channels, which grew from "The Report of the Radio Frequency Allocation Review Committee", led by Professor Huxley, and tabled in 1961. The Terms of Reference for the Committee were:—

(a) To examine the existing frequency allocations and those arising from the Geneva Conference 1959, insofar as they affect Australia with the object of ascertaining —

(i) the sections of the allocation table in use;
(ii) the sections not being used;
(iii) the extent to which any re-arrangements are possible and/or desirable so that each Department, Authority **and the licensed users with a legitimate interest in the administration and/or operation of approved Radio Services have their reasonable interest and needs for spectrum space safeguarded:**
(vi) the manner in which any further distribution of available radio frequencies might be effected in the overall National interest.

(b) To examine specially any aspects of the radio frequency position as it affects the Australian

Broadcasting and Television Services as may be referred to the Committee after preliminary review and report to the Postmaster-General by the Australian Broadcasting Control Board.

(c) To make any necessary recommendations on the above matters to the Postmaster-General.

Under (a) (ii) the Amateur Service could expect to have their interests considered along with the other services.

ITEM 6.1. THE AMATEUR SERVICE

The proposed allocations provide for the following changes . . . Allocation of 52 to 54 MHz, the same amount of space as the 56 to 58 MHz Geneva allocation, but 2 MHz less than the existing Australian allocation. . . . **Summary:** In respect to the Amateur bands the recommended allocations are generally in close agreement with those of the Geneva Table. Where departures from that Table have been recommended they have been considered necessary because of the needs of other Australian services.

ITEM 6.4. THE DEFENCE GROUP

The basic aim of the Defence Group as far as frequency allocations are concerned, is to ensure, as far as possible, **global operational compatibility with our Allies both in the military and scientific fields. Thus ideally, all frequency allocations for the Defence Group must be in very close agreement with the Geneva Table.**

A problem which arises from time to time is caused by the use,of necessity, of military equipment primarily designed for use in other regions.

Recommendation No. 6 in the Huxley Report is interesting: "Relating to the protection of frequency users in areas of marginal reception of radio signals. The Radio Frequency Allocation Review Committee, NOTING: 'that there have been instances in which users of properly assigned and properly used frequencies have been required to change frequency or close down to protect television reception in areas of very low signal strength; RECOMMENDS: that the assigning authority to be directed **to support any user who conforms to the official requirements and place the onus of satisfactory reception of radio signals on the individual receiver.'**

Originally the amateurs were to lose the use of 50 to 52 MHz in 1963 when the former 1 metre band (288 MHz) was discontinued, but the six metre enthusiasts received a respite until 1st April, 1964, when the lower two MHz disappeared with the full time operation of Channel 0, which covers 45 to 52 MHz. But that certainly did not end the story. The amateurs of Australia are permitted to operate 52 to 54 MHz **providing** they do not cause interference to other services, and the one we are concerned with at present is television. Equally troublsome is the fact that Channel 0 interferes with amateurs operating legally in their own band. Interference is experienced principally when operating reasonably close to the transmitter, and consists of extraneous signals spaced every 15.625 kHz across the band. These TV component signals have a rough sound because in effect they are subcarriers at the line oscillator frequency and have their own sidebands of 50 Hz frame and video components. This type of interference will be worse on test patterns than the normal programmes since the test patterns are electronically generated with better waveshapes with consequently more sideband frequency components. Thus despite the best in filter design, it will be inevitable that some energy must escape from a 100 kW transmitter located a few miles away.

There are two main problems:

If the amateur transmits in a Channel 0 area he will interfere with TV receivers due to their front end design having a wide bandwidth and thus inherently poor selectivity, though this may vary with some brands of TV sets. The second problem is continual rubbish on the amateur band from the Channel 0 transmitter!

The Region III area in which Australia is situated, along with many other Pacific nations, is an area where the full 50 to 54 MHz amateur operation is permitted, notably in Japan, Siberia, Hong Kong, Phillipines, Hawaii, USA, Mexico, Noumea, New Hebrides, plus other call areas such as KG6, KL7, CE2, FK8, and most recently P29, who also have been granted full 50 to 54 MHz status. New Zealand has 51 to 53 MHz. Most of the areas mentioned above have already been worked from Australia since the increasing sunspot numbers of cycle 21 have been observed. The remainder and many more will be available for working before the cycle wanes once again in two to three years.

Cycle 19 in 1958-59 provided many outstanding contacts from Australia, and the September 1978 issue of AR carried words from a letter published in my notes from Bill VK2HZ, outlining the extent of the six metre coverage by amateur stations at that time. In the light of the experience then which should surely have been still vivid in the minds of those members who compiled the Huxley Report, how a proposal for a TV allocation between 45 and 52 MHz could have been made is beyond comprehension.

AUSTRALIA

Australia is unique in the world in having two non-standard television allocations, Channel 0 and 5A, both of which are immediately alongside an amateur band, our two most used VHF bands. Additionally, because there are three main Channel 0 stations in Australia, Melbourne, Brisbane and Wagga, spaced just the right distance apart for maximum interference to one another during periods of sporadic E activity, the mind fails to centre on any sound reasons for this allocation. Cycle 19 showed it possible for overseas stations to be heard in Australia at tremendous strength, and that was before a Channel 0 allocation — **I am sure the proprietors of the existing Channel 0 stations now will be looking with some trepidation to the extent of the likely interference pattern in 1979-80.** I have personally monitored a number of TV video and sound signals in and around 48 MHz from Korea, China and other Asian areas, and signals can be up to 5 x 9 + 30 dB, and that will cause a lot of QRM to Australian Channel 0 stations, and I will suggest, given the right conditions, those overseas stations will be there for many hours of the day at that strength, and if TEP conditions prevail as well, the signals may well continue right through until midnight local time!

NEW ZEALAND

Our near neighbour New Zealand suffers from interference from the Australian Channel 0 stations on their Channel 1 allocation of 44 to 51 MHz, and it would seem likely they interfere with Channel 0. Perhaps the only good luck story one could speak of is that the Channel 0 stations are lone operators, not like New Zealand where Channel 1 feeds a number of low power translators, so anything which upsets the originating stations affects all the others, with the result people in hidden valleys share the QRM with their wealthy neighbours in the cities!

The shortsighted thinking at the time which allowed Channels 3, 4 and 5 to be placed in an international FM band is also beyond comprehension. Now that an FM service has been rightfully established in its correct place in the spectrum, other channels have had to be brought into use to allow the original stations to continue operating. That this has or is being achieved is credit to the licensing authorities except for the proposed increased usage of Channel 5A.

The part which hurts me the most I think is the point I have written about before, is the fact that the USA with something like the land area of Australia, with well over 200 million people, this being 15 times as many as Australia, they have only the same spectrum space that we have, yet they are able to give their amateur population more frequency space, to the extent of 7 MHz in the VHF spectrum alone (an extra 2 MHz at 50 MHz, and 5 MHz at 220 MHz!), yet it would be fair to assume, I venture to say, that they would have many times the requirements for space for commercial and military communications that we do, but they seem to manage. The USA has considerably more television stations in the VHF area, but in addition, they have made good use of the UHF spectrum for additional TV services, ethnic and otherwise. The great number of large population towns there must compound any problems they have of frequency allocation, **but they seem to manage!** And they have never found the necessity yet to consider the introduction of any Channel 0 or 5A allocations, nor have I heard of any reports of reducing the amateur bands similar to that in Australia.

ABOLITION OF CHANNEL 0

And so the case for the abolition of Channel 0 is started! In the paragraphs which follow soon are variations and thoughts for alternatives which should be studied first by anyone looking to ridicule them. The 52 to 54 MHz band in Australia for the amateurs is a Primary Service. But this is in name only. Any amateur who dares to operate a transmitter which causes any interference to a television viewer is under threat of closure, even though he is operating his station technically correct, and able to pass any inspection likely to be made at Departmental level. At best he could be placed on restricted hours of operation such as outside television hours, etc. Others have to live with their neighbours, and this can become dangerous if the ire of certain types of neighbours is aroused, broken aerials, rocks on roof and broken windows are not unknown. So for peace, the amateur is likely to stop operating voluntarily. Certainly amateur bands other than 52 MHz can also cause TVI, but the risk is not as great when operating HF if the equipment is suitably enclosed and filtered, but that's quite another story.

COLOUR TV

The average modern colour TV with its coaxial antenna lead is helping to keep the QRM problem in a better position, and most CTV sets are either fitted with UHF tuners or have provision for them to be fitted so it seems ridiculous to put off the day when the UHF TV band should be opened. The almighty dollar in the eyes of some commercial interests seems to take precedence over sane thinking, UHF coverage of the populated areas of each State would be pretty good, with solid signals being the order of the day. Perhaps not entirely relevant, but I have noted with interest over the past two years since the fitting of a UHF (470 MHz) two-way radio system to my work vehicle with the base station suitably situated on a high hill just like the television transmitters, the fantastic coverage I can get with a 25 watt transmitter feeding into a 15 cm whip on the roof of the van, and a 25 watt base station to a unity gain antenna. I work over most of the area of the Adelaide Hills and there are very few places, including valleys and townships where it is not possible to operate. If I had a 100 kW e.r.p. to play with I think the coverage might even be better!

COMMERCIALS SUMMARY

That generally sums up the commercial position as it affects the operation and interference to television stations and viewers. **Recapping:** Every summer sees considerable interference to Channel 0 viewers due to sporadic E making available stations from other areas on the same Channel, and this also includes New Zealand. With the advent of greatly enhanced sunspot numbers in cycle 21 not only will this QRM persist, but it will be added to by stations from Asia and Pacific areas which will be quite capable of causing as much QRM and perhaps for longer periods. Additionally, it is well known power lines cause interference to radio and TV reception during hot weather, and as this form of QRM peaks around 50 MHz, Channel 0 will further suffer. In VK5 we get enough grumbles from TV viewers who complain of ignition QRM on our Channel 2, what it must be like in Melbourne and Brisbane on Channel 0 I shudder to think!

THE AMATEUR OPERATOR

Having said all that, let us now turn to the more specific situation as it confronts the amateur operator, who has lost out badly over the years through the loss of 50 to 52 MHz in the first place, and then by not being able to operate when desired in Channel 0 areas due to TVI. Thanks to as much publicity overseas as we have been able to generate, other countries are slowly coming around to accepting we are operating 2 MHz higher than they do. The lost opportunities for rare stations must be great, however, as when conditions are good overseas, those stations will continue to operate around 50 MHz until conditions continue to wane or stations run out — then they may think of us down here who have been calling in vain.

This article will be concluded in the next issue. ■

QSP

RFI

The editorial in CQ of April '78 deals with the age-old problem of interference resulting in controls over amateur and CB equipment. It continues "The frustrating part of the situation is that there is no control at the other end of the interference chain, nor is there an effective means of securing a reciprocity in dealing with interference. What I am getting at is that we (amateurs) have been conditioned to accept the blame in toto for rectifying a situation hat cannot be resolved by one side. The manufacturers of consumer devices apparently have been set aside as a privileged class, the consumer has been absolved of responsibility by his retail payment and the culprit is still you and me".

AMATEUR RADIO — SERVICE

Writing in The Propagator for June '78, the President of the Illawarra ARS, VK2BBG, crystallises some aspects of modern thoughts, thus —

"The Citizens Radio Service has been with us for some time. For better or worse, it remains a starting point for many future amateurs. How many future amateurs come from this and other areas, depends upon the communities awareness of amateur radio. Not only its existence, but its utility. The days of "we're here because we're here' have gone. We can no longer look down our noses at the uninformed public. For without that public, amateur radio will not survive the upheavals that are taking place within and without the amateur service. For that is what we must carefully cultivate, the service of amateur radio.

"Service is a doing thing. Not a thinking or talking thing. The amount of time available is in direct proportion to the importance of the task. I would suggest that helping the service aspect of amateur radio is as important as tomorrow.

For these reasons, I commend the workings of your club, the WIA, the novice course at the tech, and the Wireless Institute Civil Emergency Network. Look at them carefully, they are dependent upon your service."

In similar vein in relation to CB is the editorial in "Zero Beat" of June 1978 —

"One thing seems to have become obvious over the last few months and that is the fact that the combination of CB radio and the novice licensing has opened the way to a spectacular increase in the number of amateurs — providing that advantage is taken of the situation. The biggest danger is that there may arise hostility and lack of communication between the amateurs and the CB organisations. And unfortunately it seems that if this hostility does arise it will mainly be the fault of the amateurs. There are too many amateurs who have the attitude that getting a licence was hard for them so why should it be made easier for others. This is selfish and illogical and can only damage the amateur cause. The other harmful attitude is that of looking at CBers as though they were second class citizens. There are a lot of ratbags, but don't let us forget that there are also quite a few among the amateur fraternity themselves. Many of the CBers are becoming really interested in radio communication and with sympathetic help will turn into first class amateurs. We have a tremendous potential for recruits. Let us make the best of the opportunity." ■

VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston. 5233

AMATEUR BAND BEACONS

VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
	VK2WI, Sydney	144.010
	VK2RHR, Mittagong	144.120
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.440
	VK3RTT, Mt. Mowbullan	144.400
	VK4RBB, Brisbane	432.400
VK5	VK5VF, Mount Lofty	53.00
	VK5VF, Mount Lofty	144.800
VK6	VK6RTV, Perth	52.300
	VK6RTU, Kalgoorlie	52.350
	VK6RTW, Albany	52.950
	VK6RTW, Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RNT, Launceston	52.400
	VK7RTX, Ulverstone	144.900
	VK7RTW, Ulverstone	432.475
VK8	VK8VF, Darwin	52.200
JA	JA2IGY, Nagoya	52.500
KG6	KG6JDX, Guam	50.110
KH6	KH6EQI, Hawaii	50.104
TI	TI2NA, Costa Rica	50.080
W	WA6JRA, Los Angeles, USA	50.091
ZL1	ZL1VHF, Auckland	145.100
	ZL1VHW, Waikato	145.150
ZL2	ZL2VHP, Palmerston North	52.500
	ZL2VHF, Wellington	145.200
	ZL2VHP, Palmerston North	145.250
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

I note from "Break In" that the Waikato VHF Group in ZL1 area has under construction a 70 cm beacon, which is planned to run 10 watts output to an omni-directional antenna, with FSK ident. In the Upper Hutt area of ZL2 a six metre beacon is being constructed, and will eventually operate on 52.510 MHz. I also note some attempt is being made to arouse a fresh interest in six metres in ZL, which appears to have been very low of recent times, so much so that VK and JA and KH6 operators have been asking where the ZLs are, especially as their Channel 1 TV station has been heard overseas with some frequency. Certainly at my QTH it's a red letter day if you work a ZL on six metres. Without an increase over there on six there is very little likelihood of working ZL on 2 metres, as the state of the band on six is quite often a good pointer to where the MUF is, and a guide to when calls should be on 144 MHz.

DARWIN NEWS

Graham VK8GB sends along some fresh news of activity in the Darwin area, if only to make our mouths water down here with the continuing epic.

20-6-78: 52.050 JR1AUW at 1300Z. 22-6: 52.050 JR1AUW, JH6TEW, JJ1THA, JR6NSZ and JA2HMO 1150 to 1235Z. 1-7-78: 52.050 KG6JIH, JR1AUW, JH6TEW and JA2ODM 1025 to 1310Z. 14-7: 52050 KG6JIH, 1100Z. 16-7: 52050 KG6DX, JA4HPU 1115 to 1220Z. 17-7: 52.050 JR1AUW, JJ1BRN, JF3SDD; 52.033 JA4MBM, 1149 to 1225Z. 18-7: 52.030 JR1AUW; 52.050 KG6JIH, JA2BZY, JA2DDN and KG6DX, 1245 to 1345Z. 19-7: 52.030 JR1AUW, JH1JHA; 52.052 KH6JSG/KG6, 1245 to 1305Z. 20-7: 52.050 JR6NSZ; 52.033 JA4MBM, JH1USR, 1315 to 1340Z. 22-7: 52.047 JA4MBM; 52.050 KG6DX; 52.048 JH4EVU, JR1AUW, JH6TEW, 1045 to 1358Z. 24-7: 52.050 JA1 to 6 inclusive for 17 contacts, 1053 to 1415Z; KG6JDX at 1135Z; 144.150 JH6MTJ, JH6OYA, JH6DVD, JH6IHN, JR6HSO, JR6BVG, JR6TEI, 1250 to 1308Z. 27-7: 52.050 KG6JIH, 1233Z.

2-8-78: 52.050 KG6JIH, 1254Z. 3-8: 52.050 JH4XJH, JH6TEW; 52.033 JA4MBM, JR1AUW; 144.110 JH6TED, 1155Z. Six metre contacts between 1145 and 1240Z. 4-8: 144.100 JH6EPS, JR6EKD, JH6PWK, JH5XTN and JH6IFF, 1137 to 1154Z; 52.0505 JH1LZC, JI1ETU, JA5RVY, JA4MBM, 1200 to 1218Z. 5-8: 52.033 JA4MBM, 1135Z; 52.050 JH6TEW, 1140Z; 144.39 JH6TEW, 1152Z. 7-8: 52.050 JA2HMO, JA5GVF, JF2DEJ, JR6OTM, JH1JHA, JH6TEW, JR6OST, KG6JIH, 1117 to 1210Z; 52.033 JA4MBM, R1AUW, 1226 and 1237Z; 50.195 4D88UT, 1254Z.

Graham remarks: "Compared with this time last year conditions have been excellent. As you can see there has been virtually no break in six metre openings, and two metre openings are occurring again! I would predict a very good season for all stations in VK this spring.

"DXpeditions: There are two six metre DXpeditions planned for August. One to Manila by JA amateurs. Call sign 4D8UT and operating on 50.195 SSB/CW beacon. The other to KG6 Saipan, call sign KG6RO. Some JA amateurs and KG6JIH were involved. Running FT625 plus 100 watt linear to 6 element yagi, beacons 50.110 and 50.210 MHz.

"The following stations in Russia contacted JA stations on 144 MHz Es this year: Vladivostok: UA0LFK, RA0LAN, RA0LFI. Sakalin: UW0FBG, UA0FDA, UW0FZ, UA0FAM, UA0FBE. Kharbarovsk: UA0CAA, UA0CAF, UA0CBO, UA0FDA. Opening times were between 0800 and 1000Z and around 0300Z with many openings. I am hoping to organise some 144 MHz skeds with some of the Russian stations.

"Brian VK8VV and myself checked up on our two metre contacts and he holds the longest distance, and understand he will be making a claim for an Australian Record."

Thanks once again, Graham, for keeping us all up with the news. We certainly do look forward to the Spring openings, and will be keeping a weather-eye on late evening TEP conditions in the hope 144 MHz may decide to come this far!

Because of the interest which revolves around these winter time contacts in Darwin, I have this month included the actual call signs of the stations Graham worked, for those of you who have been making a study of the conditions and areas covered, times and frequencies, this will be of some use to you. It is still interesting to note the 2 metre path still only covers the JA4 and 6 call areas, which are virtually in a north-south path to Darwin over a very small angle. A similar narrow angle path would exist between the Tokyo area and Adelaide, and contacts may some day be possible to there if the right conditions can be found. We are trying down here!

John VK2ZBD of Tea Gardens, 40 miles north of Newcastle, has written to say he has decided to start up again on six metres after an absence of 6 to 7 years, with a home-brew transverter feeding a pair of six element yagis at 60 feet! He plans to eventually run 200 watts PEP. He felt a bit disappointed when on 12th August he had removed the transmit driver stages for modification to hear VK2AIP at Springood on shortskip, and later strong signals from VK7MT, VK7JG and VK7ZAH all on 52.050. Just shows even in the winter time you can scarcely afford to have your six metre equipment out of action! Good luck, and thanks for writing, John.

A letter to hand from Ray K5ZMS of SMIRK, contains a few points of interest as follows: Ray refers to the breakdown of WARC 79 proposals which, amongst other things, indicated Region 1 has allocated 47 to 68 MHz for broadcasting. He says this is not entirely true as countries like Gibraltar, South Africa and others have allocated a six metre band for amateurs. There are about half a dozen other countries who seem to be leaning towards allowing amateur usage in the future. (Again probably due to increased QRM from other countries. . . . 5LP.)

Ray goes on: "If the present trend of reception of VK/ZL 6 metre signals in USA continues, Channel 0 hasn't seen anything yet in the way of interference, till they start getting TVI from our 6 metre repeater stations, plus those in JA, KH6, KG6, etc. I had a report also of two VK5 stations being heard in Alaska! ZL TV has been received in Mexico. The aim of SMIRK is to try and obtain 6 metres 50 to 54 MHz as a world-wide allocation." Good to hear from you, Ray, we are doing what we can down here about Channel 0.

A SMIRK newsletter received as I write this details an extraordinary amount of 50 MHz activity right throughout the world, but more particularly in the northern hemisphere. It's already incredible what is being worked. G3COJ says they are listening for beacons and signals on 6 metres in the UK and are hopeful of being allowed to run a beacon again this cycle. Cyprus beacon (5B4CY) on 50.5 heard 599 in UK, 1726Z on 4-6-78. ZS6PW beacon is on 50.030. ZB2VHF, the Gibraltar beacon, is to be re-located right at the top of "The Rock". ZS6HVB beacon is on 50.1 MHz. Scandinavian Radio Amateur Societies are making a strong pitch for 50 to 54 MHz in their WARC 79 petition.

"KGJIH runs beacon on 50.110. VS6BE also has beacon. Formosa could also be on six with VB2 prefix. KL7 Alaska very active on six, and there is a beacon running at Anchorage, on 50.110. 6Y5RC also has a beacon! There is just so much activity being reported one doesn't know where to start and stop. Bob K6RNQ says six metres will

open on trans-continental F2 when sunspot count reaches 120, and when CPRL charts indicate an MUF of 42 MHz, the MUF will reach 50 MHz on 10 per cent of the days of the month indicated."

From QRM I note VK4ZNC has sent an IC 502 and linear to FK8AB, who is now looking for VK signals, and monitors 52.050 MHz. They also advise the possibility of a six metre beacon in Hobart on 52.475, and when this happens the Launceston beacon will change frequency to 52.470 MHz.

INTERESTING EVENTS ON SIX METRES

David VK5KK has done some research on early six metre activities, and the following should be of interest.

"25-8-47: On this day the first of the more unusual long distance openings attributed to that which later was to be collectively called TEP. VK5KL in Darwin worked W7ACS/KH6 Pearl Harbour, distance of 5350 miles. On 27-8-47 another "first" when XE1KE Mexico worked LU6DO in Temperley, Argentina, distance 4900 miles. On 7-10-47 W6UXW California had a partial contact with J9AAO Okinawa, but not a confirmed contact.

"Meanwhile, the North/South American path was being hotly worked. 14-9-47 'first' USA to South America contact, W5FSC Houston, Texas, to OA4AE Lima, Peru. On 15, 16, 17, 18, 19 and 20 September many Mexico to Argentina contacts were made, all within 1700 to 2000 local.

"Yet another 'first' on 12-10-47, W7ACS/KH6 worked W5, W6 and W7, the first time six metres had been worked to mainland USA from Hawaii.

"At this time propagation was thought to be almost completely accounted for but with openings at later than expected times (for F2 layer that is) and consistent Trans-equatorial paths changed the situation. The theory we now know was largely formulated in the late 1950s and early 60s. However, MUF on these paths were only reported to 80 MHz. (1.5 times previous days F2 MU.) Some predictions as to the MUF of night-time single hop TEP were, until recently, only put to about 100 MHz. It is now thought that something like 250 MHz is more in order, but it would seem at the moment it becomes a more North-South path as frequency is increased. Because of this I think all efforts should be made to get back 50 to 52 MHz so as to place us on even terms with other 6 metre countries and make co-ordination of higher frequency experiments possible.

"On 27-10-56 'first' Japan to USA contact, JA1AUH (a call that is still active and has been working recently from VK5 at least) to K6EDX. It is interesting to note that by May 1958 JA1AUH had worked 16 USA States.

"With the opening of 50 to 54 MHz to VKs in late 1957, it became possible to work JAs without trying splits from 56 MHz, etc. During 1958 there were 6000 JAs and about 10 per cent were on six metres. By March 1959 VK4NG had worked 532 JAs. Also 400 JAs had worked USA during 1958. One notable contact, JA7JU to VE7KW on 23-11-59.

"Also first VK to mainland USA 6 metre contact occurred 15-3-58, Bob VK4NG to W6BJI. Other calls from both sides involved on the same day included VK4HD, VK4ZAZ, VK4ZBF, VK4XJ and K6ERG, K6PXT, K6RNQ, K6MMT and W6RLB and W6WWD. Time 0450Z to 0530Z. Band also opened on 20-3-58. USA stations were having more luck with ZL, band being open on February 1, 7, 20, 21, 22, 23, 28 and March 19 and April 16. There were still being contacts to ZL after they were shifted to 52 MHz in 1959. And VK3ALZ worked ZE1FU on 1-5-59."

Many thanks, David, for that interesting round-up. Incidentally, David VK5KK, and his father, Keith VK5SV, worked at least 113 different stations during March and April 1978, all JAs except a contact to KG6DX on 1-4, which was the first KG6 to VK5 contact that we know of. There were two night time TEP openings on 13-4 and 16-4. Calls were made on 144.1 and 144.110 with 32 elements pointing north, but no results.

By the time you read these notes there should have been some interesting six metre contacts from Australia to other lands, if the previous pattern continues to be followed. It will hardly be necessary for me to remind VHF operators to listen and call on the band. But do please take off enough time to write to me and report what you have worked and heard. Keep a good ear on 50 MHz because that's where most of the action will be.

Nothing outstanding has occurred on two metres apparently as nothing has arrived on my desk in the way of reports. But keep your ears on that band, too, from September through to at least April or May next year, interesting contacts could result.

During September I shall be making a journey to Western Australia and hope to meet up with Tony VK6BV in Kalgoorlie, Peter VK6ZDY in Perth, and of course all the boys in Albany. **(Don't forget to take your camera to VK6, Eric, and send me some photos of the VHF activity in that area.—Ed.)** Maybe I shall have something worth reporting from the west on my return. I will be making other arrangements for this column for the November issue, which is normally prepared at the end of September. I won't spoil your surprise by telling you.

Closing now with the thought for the month: "Life is like a grindstone — whether it grinds one down or polishes one up, depends entirely upon the material one's made of!"

73. The Voice in the Hills. ■

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

32 Dorset Street,
Busselton 6280, WA
27th August 1978

The Editor,
Dear Sir,

My thanks to Geoff Wilson VK3AMK for his letter in August AR, which exactly expresses my own sentiments, with the possible exception of the words "particularly in Western Victoria". Here in VK6 we have our problems, too, with a Channel 5A transmitter brought into service this month.

Where Channel 5A and Channel 0 are concerned, complacency can spell nothing but disaster. We've lost 27 MHz, but 2 metres is a horse of a very different colour. Here we MUST take off the kid gloves and show the authorities that this is where we make our stand: that we WILL NOT be forced off the 2 metre band by TV transmitters operating contrary to International frequency allocations.

On another subject, congratulations to most participants (including the many Novices) for the high standard of operating in the recent RD Contest. As usual, however, there were still too many examples of the annoying practice of "frequency jumping". You know how it goes: You call CQ and are fortunate enough to find a queue waiting for QSOs. You've worked a couple and then someone jumps in and calls the station you've just worked. You are forced to QSY and start CQing all over again, with the rest of the stations waiting to contact you, just left for dead.

Oh, yes, we know about skip, and on the DX bands you don't hear all the locals, but you don't have to listen on a frequency for long to know what's going on there. We are all human, and perhaps all a bit thoughtless at times, but it's so easy, and so much more friendly, to jump in with a quick call and "see you down 2". And what could be more refreshing in the turmoil of a contest, than to hear the question "Is this frequency in use?".

Finally, in reply to Eric Trebilcock and various other letters for and against continuing CW in Amateur exams.

The real joy of CW QSOs will never be known to the Amateur who regards morse as an obstacle to be overcome to obtain a licence, and who does not then persevere to become really proficient.

If all new licence holders and potential licence holders could only realise what a satisfying and exciting form of communication CW operating really is, I feel sure they would be determined to master the art. For an art is what it is, and, sadly, a dying art.

Conservation is a household word today. With Morse Code almost a thing of the past in all commercial spheres, who will conserve this art if it is abandoned by Amateurs? Is not the Amateur Service the logical place to preserve this traditional communication medium for the pleasure of future generations?

Yours faithfully,
E. F. Davies VK6ED. ■

10 David Street East,
Springwood 2777
25th August, 1978

The Editor,
Dear Sir,

In August issue the Federal President expressed the opinion "It was felt that the examination standard is becoming more consistently at a level considered as suitable for entry into amateur ranks". I regret that I must express quite a contrary opinion, as the last Novice theory examination paper was passed by Novice candidates who had completed only a small portion of the course provided by the Club with which I was associated. In short, it was possible for candidates to obtain Novice qualifications with only the bare elementary topics covered and with no training in the important items such as transmitters, aerials and — MOST IMPORTANT — problems of interference.

Furthermore, the use of the word "consistently" implies that there has been a series of Novice papers of approximately equal standards — which is far from being true. It appears that the principle behind the Novice examining still remains at "It doesn't matter much what we test them on as long as we make up 50 questions". **THIS IS NOT GOOD ENOUGH!**

There should be some valid basis for determining the content of Novice theory papers. I suggest that we should expect Departmental testing to determine:—

(i) that successful Novice candidates can "get on the air" without undue problems to themselves;

(ii) that they should be able to set up their stations and operate without problems to other licensed Amateurs on or near the Novice segments;

(iii) that they should be able to operate without causing problems to other users of the radio spectrum — which will include testing on TVI, BCI, harmonics, parasitics, etc.

Accordingly, there will be some questions and topics which may be classed as "examworthy" insofar as they will help the examiners to assess in terms of the principles stated. However, we see far too many questions of the "unexamworthy" category, which bear no relation whatever to the obvious aims of the testing process. I must, therefore, maintain that there is a long way to go before satisfactory Departmental examinations may be regarded as "suitable" in terms of the President's statement.

Yours faithfully,
R. C. Black VK2YA. ■

4 Van Diemens Crescent,
Burnie, Tasmania 7320
15-8-78

The Editor,
Dear Sir,

I wish to thank those concerned with requesting and granting the extra space on 80 metres for Novice use.

73s,
Fred Reid VK7NFR. ■

The Editor,
Dear Sir,

I have just found out that some amateurs have been working 6 metre DX on 50 MHz, which is outside the Australian allocation of 52-54 MHz.

This I find very disturbing to me, knowing these amateurs are deliberately working out of band, and which is very irresponsible on their part. It will not improve our relationship with the P. and T. Department and the Government, especially during the Channel 5A crisis. I am a keen 6 metre operator and believe we should try to get 50-52 MHz back. Amateurs outside the Channel 0 service

area should be allowed to operate on 50 MHz any time, and those who live in places where there is Channel 0 to operate outside the Channel 0 transmitting hours.

I myself would love to work JAs, etc., on 50 MHz — but legally. To those amateurs who now operate on 50 MHz, wake up to yourselves and slide back up to 52 MHz, otherwise you will do more harm to the amateur radio service than good.

Lionel K. Curling VK3NM. ■

8 Carinya Road,
Mt. Colah, NSW 2079.
29th July, 1978.

The Editor,
Dear Sir,

I am concerned about the news and correspondence in AR and other places that there is the possibility of Television Channels 0 and 5A being used more widely in Australia. Like most of your correspondents I am concerned about the fact that deficiencies in the design of many television receivers could lead to an increase in TVI from amateur operation in the 6 and 2 metre bands.

However I am also concerned at the negative attitude expressed in the comments that we will virtually lose the two bands. Surely, if the use of Channels 0 and 5A is extended, that should present a challenge to amateurs to solve the technical problems that may arise. Have the commercial operators abandoned the 70-88 MHz segment because it is adjacent to Channel 2, or the 148-174 MHz segment because it is adjacent to Channel 6? I think not.

If we amateurs go on behaving like "appliance" operators and don't use our technical abilities to tackle the problems that come along, we can be sure that there are many commercial interests who would be quite happy to take over our bands and solve them for — not us — but themselves. And if we continue to go crying to the Government in despair I am likewise sure that they would be quite content to hand over the bands to people who could profitably use them.

By all means let us point out the real problems to the authorities but let us also be positive in our approach and be prepared to solve them ourselves.

Yours sincerely,
Robert V. Barringer VK2ZIB. ■

The Editor,
Dear Sir,

WHY DO WE NEED PUBLICITY?

The days of just sitting back in silence holding our principles in one hand and our virtues in the other and expecting miracles to happen have gone. The days of justification in terms of social, economic and political areas have risen above the less but still important technical considerations. However, linked to all these interacting considerations are their relationship to public relations. When we talk of publicising amateur radio we usually refer to the few keen people who, like all the rest of us, have a daily job, a family to look after and lots of other activities to get involved in apart from amateur radio.

In the United States a full-time paid staff is supported by the ARRL which makes possible a wide range of avenues from contacts into the radio, TV, film and press industries through do-it-yourself PR kits such as how to be a success when you're being interviewed over your local TV or radio station; how to write an appealing article for your local paper which the editor won't be able to refuse, etc.

In Australia the greatest handicap is that such an important area as publicity, our show-piece to the general public, is totally lacking, because the only activists in this area are the few keen un-co-ordinated volunteers.

Hardly anyone works in the mining industry, yet we know "they are the backbone of our country", and when the general public must make the final decision one way or another — it will be PR — the showcase of the mining industry which will have had an important effect.

How much public support can we expect from the general public as a result of the Channel 5A and Channel 0 dilemmas? If the public don't even know we exist then one would expect not very much as opposed to the appealing proposition of immediate community service programmes over existing VHF TV equipment.

A nationwide call for a response one way or the other could be seen in this way:—

People can vote for the Amateur Service (a group they have never heard of) which advises that UHF is best and that VHF would disrupt some of their activities versus the TV Service which want the most economical currently existing VHF system.

The results tend towards the VHF system.

Take another case where the general public knows that a thing called Amateur Radio exists, that it's a hobby made up of individual people like you and I who get into a whole variety of radio activities.

If this much is not known then there is nothing to say that the new TV system must be on UHF.

However, if the public can identify with hobbyists who are being threatened, then although VHF is possible, people could favour the not too long term variable UHF proposition in favour of both services emerging unscathed.

This theoretical view of publicity outlines the concept of "What's in a name". Basically it's this — if people don't know you by your name they are more likely to support a concept they do understand.

The TV Service may have no more significance to a person than does Amateur Radio. For example, the non-migrant may not be interested in the proposed migrant TV service and he may not be interested in becoming an amateur hobbyist. Which way would such a person vote? There is nothing intrinsically correct about either VHF or UHF. Any technical ideal is only achievable when economic and political considerations are met first — this is surely the case of the introduction on a short range system being introduced on to 11 metres, although a balance was struck in the adoption of a transition period to UHF for CB.

Why, we could ask, are so many well known former CB advocates, having won the battle, now taking out amateur licences? Were not the elements which attracted them to amateur radio now, present before CB was legalised?

The answer is publicity. Publicity is letting people know what amateur radio is all about, people are listening, they like what they are hearing and that is why the great interest in the hobby.

During the campaign to legalize CB there was very little amateur publicity but lots of CB publicity. CBers regarded themselves as hobbyists, and amateurs were seen as more of the professional class of person.

What's happening today? The CBer who finds out about amateur radio is identifying it as a hobby which he or she can become involved in.

What about the publicity scene. Basically we are still at the level of attracting the existing hobbyist. Amateur Radio Action now being available on the newstand seeks out WIA and non-WIA members as well as newcomers, especially from the CB area. While both AR and ARA are doing excellent work in their areas, the general public is still largely untouched.

The question now arises **Is the goal of publicity to turn every person into an amateur?** Of course it's not, its simple task is to reach the whole community in presenting a basic showcase which reflects what amateur radio is — to let the world know of its existence so that when community support is required we don't need to wish we had 14 million amateurs, but we are pleased that 14 million people know who we are.

Yours faithfully,
Sam Voron VK2BVS
2 Griffith Ave., East Roseville, NSW 2069. ■

11 Shire Street,
West Wyalong, NSW
August 9th, 1978

The Editor,
Dear Sir,

The "Sugar Coated Oscar" in AR for July was interesting and I have a printout for my QTH, but I am still having trouble with "time". Living in amateur isolation it is hard to get information. Are your Oscar 7 predictions in GMT and how do I convert to local time at this QTH for this day? Can you recommend a book or source of information on this subject that is all time systems around the world (exact).

Many thanks.

Yours faithfully,
Ron Goodwin VK2BKN.

Editor's Note: The charts are in GMT and to convert to EAST add 10 hours (9 hours when daylight saving is introduced). The book "Oscar from the Ground Up" should provide you with most of the information you require (available from Dick Smith stores and most technical book shops).

Bob Arnold VK3ZBB is also forwarding you some further items under separate cover. ■

AROUND THE TRADE

MICROWAVE MODULES

Amateur Electronic Imports, PO Box 160, Kogarah 2217, NSW, distributors of the well known Microwave Modules, have available the MML432/100, 100 watt, 432 MHz linear power amplifier.

This solid state 432 MHz linear power amplifier is intended for use with any existing 432 MHz equipment having an output power of 10 watts. When used in conjunction with such a drive source this linear amplifier will provide a power output of 100 watts minimum.

The inclusion of the latest state of the art power transistors (each of the final transistors being rated at 145W dissipation), guarantees a highly reliable and ultra-linear unit which is suitable for all modes of operation (SSB, FM, AM, CW, RTTY and TV).

The amplifier utilises recently developed matching techniques which allow safe operation even when improperly subjected simultaneously to 50 per cent overdrive and a supply voltage of 15V.

Also available is the microwave module's dual range 432-434 MHz and 434-436 MHz converter. The extra range being for amateur satellite reception. The converter is intended for use with either a 28-30 MHz or 144-146 MHz receiver to produce a high receive capability for satellite terrestrial communication. ■

AEL HORN ANTENNA, 18 to 40 GHz

Scalar have announced that American Electronic Laboratories have introduced horn antennas, which provide moderate-gain, circularly polarized performance in the 18 to 26.5 GHz and 26.5 to 40 GHz bands, respectively.

A data sheet on AEL models H-1629 and H-1630 horn antennas is available from Scalar Distributors Pty. Ltd., PO Box 48, Kilsyth 3137, Victoria. ■

Dick Smith Electronics, an Australian distributor for Yaesu amateur radio equipment, is pleased to announce stocks of the new range of Yaesu amateur band vertical whips, specifically designed for mobile use.

They can be bought as a complete set, or purchased individually, and include a very rugged gutter mount base and individual whips for all HF bands. A short 2 metre ¼ wave stub and a combination ¼ wave 6 metre/5/8 wave 2 metre antenna complete the set.

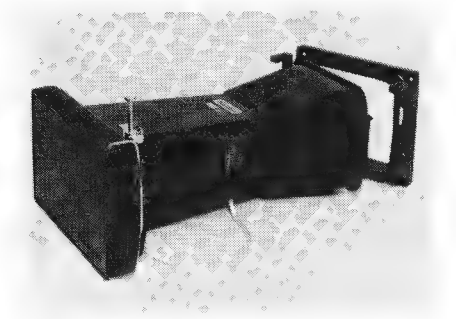
(Cat. Nos. D-4160-D-4118 refer.) ■

LATEST BWD CATALOGUE

BWD Electronics Pty. Ltd. have released their latest Shortform Catalogue, which includes a general range of oscilloscopes, oscillators, power supplies and the BWD MINI LAB and describes one of their latest new products, the BWD 540/701 DC-100 MHz Oscilloscope/Video Line Selector Dual Instrument Package.

BWD have also released a new oscilloscope camera, Model 7000. All the BWD products are

illustrated extensively, but more detailed technical information is available on individual instrument data sheets if required. Also available is information on their wide range of power supplies. A comprehensive six page data sheet covers all specifications which are fully detailed for ease of selection.



BWD Mod. 7000 Osc. Camera

Catalogues are available from BWD Electronics Pty. Ltd., Miles Street, Mulgrave 3170, or PO Box 325, Springvale, Victoria, Australia 3171, Phone (03) 561 2888, or from their authorised national or international representatives. ■

AMATEUR BAND ANTENNA COILS

The reliable REYCO range of multiband antenna coils are now available in Australia through sole distributor, Scalar Industries Pty. Ltd.

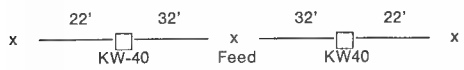
Specifications:

Power, 2 kW PEP (minimum); Weight, 6 ounces (max.) per coil; Size, 1.8 in. dia. (max.) x 5.5 in. long (max.); Absorption, Waterproof Coating; Strength, 300 (min.) Tensile Strength; Corrosion, All Metals, aluminium, including screws, nuts, washers, to resist interface corrosion; HI-Q, Optimum Form Factor on poly.

REYCO coils are actually parallel coil-condensor combinations designed to resonate in the various amateur bands.

Coils are wound with aluminium wire on threaded polystyrene forms. Rates of length to diameter plus low loss material results in a high Q assembly. Because of the high Q and impedance at resonance the coils act as effective insulators in the band in which they are resonant.

Using the kW-40 coils as a 5-band antenna approximate antenna dimensions.



On 40 metres the two 32 foot lengths provide a conventional dipole with the resonant coils acting as insulators.

On 75 metres the coils act as a loading inductance and with the extra 22 feet lengths form a dipole on 75 metres.

On the higher frequencies, with the values chosen the antenna is 3/2 waves on 20, 5/2 waves on 15 and 7/2 waves on 10.

Price Class $30 to $35.

Full details are available from Scalar Industries Pty. Ltd., 18 Shelley Avenue, Kilsyth, Vic. 3137. ■

SCALAR APPOINT WA AGENT

The SCALAR Group is pleased to announce the appointment of EVERETT INTERNATIONAL PTY. LTD., 17 Northwood Street, Leederville, W.A. 6007, Phone (092) 81 5500, Telex AA 92811, as their exclusive agents in Western Australia.

This includes the complete range of SCALAR communication antennas, screened enclosures and other products associated with radio frequency interference suppression.

A comprehensive range of the Company's mobile and field tuneable base station antennas are held in stock in Perth.

Telex communication between the two companies assures an efficient and instant information and ordering facility for frequency conscious, for special antenna systems, and for RFI suppression information. ■

CAPTIVE WIDEBAND SIGNALS

AEL's recorder computer interface series RCI accepts wideband analogue data, digitizes, stores, then delivers it to your data processor at compatible rate upon command. The RCI digitizes the input video signal using an internal, high speed analogue-to-digital converter and stores this sampled data in a memory with a standard capacity of 1.44 million words. This data can then be transferred to the minicomputer (or micro, or maxi) or data processor at a slower data rate, compatible with disk memory or other storage devices.

The RCI digitizing data is normally fixed at one value, the standard rate being 20 MHz. This rate can be decreased in discrete steps to allow increased storage time for narrower bandwidth input signals.

Further information from Scalar Distributors Pty. Ltd., PO Box 48, Kilsyth, Victoria 3137, Australia. ■

CONTESTS

Wally Watkins VK2ZNW/NCU
Box 1065, Orange 2800

CONTEST CALENDAR

October:

7/8	VK/ZL/Oceania DX (Phone and RTTY).
14/15	VK/ZL/Oceania DX (CW).
13/15	VK/ZL/Oceania DX (CW).
14/16	Manitoba QSO Party.
21/22	RSGB 2 MHz (SSB).
21/22	Jamboree on the Air.
28/29	CQ World-wide DX (Phone).

November:

4/5	RSGB 7 MHz (CW).
4/5	ARRL CW Sweepstakes.
18/19	ARRL Phone Sweepstakes.
25/26	CQ World-wide DX (CW).

CONTEST CHAMPION TROPHY

This trophy has been donated by Peter Brown VK4PJ, primarily to acknowledge the important part played by high scoring entrants in Amateur Radio contests, and also to provide added incentive to entrants.

RULE 1

The Radio Amateur, who is a member of the Wireless Institute of Australia, and holds a VK prefix and who, under the scoring arrangements of Rule 2, obtains the highest aggregate of points in the contests nominated by the Federal Contest Manager, shall be declared Contest Champion for each calendar year.

RULE 2

The Amateur obtaining the highest score in a nominated contest shall receive 10 points towards the trophy, the next highest scorer 9 points, and so on with the person in tenth place receiving one point. Where a contest has several sections, viz., CW, Open and Phone, then points will be allocated in each section, however points can only be claimed for one section of each contest.

RULE 3

An Amateur holding a Limited and Novice licence can aggregate points under both call signs, but only once in each contest.

RULE 4

The Contest Champion shall hold the trophy for a period of twelve months.

RULE 5

The Federal Contest Manager shall each year, at the time of announcement of the name of the new Contest Champion, nominate the succeeding contests applicable to the trophy, and together with such rules as he considers necessary, publish this information in Amateur Radio together with the list of all previous holders of the trophy.

NOMINATED CONTESTS FOR 1979

1. 1978-79: Ross Hull VHF/UHF Memorial.
2. 1979: John Moyle Memorial Field Day.
3. 1979: Remembrance Day.
4. 1979: VK/ZL.

To be eligible for the trophy a minimum of three contests must be entered. No formal application need be made as scoring will be done automatically by the Federal Contest Manager. ■

WESTLAKES NOVICE CONTEST

WESTLAKES NOVICE CONTEST

Westlakes Amateur Radio Club again this year announces a Contest for all Novice and Full Licence radio amateurs. The Contest will take place from 0800 GMT 9th to 0759 GMT 10th December, 1978.

OBJECTS OF THE CONTEST

To encourage contest working between amateur stations in Australia, New Zealand and New Guinea during a 24 hour period with special emphasis on contacts with Novice and Radio Club stations.

RULES: STATIONS ELIGIBLE

Only stations in VK, P29 and ZL call areas may enter. **No station outside these areas is permitted to be worked or enter a log.** Except for Radio Clubs, no multi-operator working is allowed. VK2s may work VK2s, VK3s may work VK3s, as well as stations in other areas of VK, ZL and P29.

CONTEST BANDS

All the 80, 15 and 10 metre Novice allocations may be used but Novice operators must observe the frequencies and band limitations outlined in their licence. No cross band operation is allowed but cross mode operation is allowed. Contacts may be Phone or CW.

SCORING: LICENSED OPERATORS

For contacts with Full Call stations: 2 points per contact.

For contacts with Novice Call stations: 5 points per contact.

For contacts with Radio Club stations: 10 points per contact.

SCORING: LISTENERS

Novice to Novice contact: 5 points.

Full Call to Novice or Novice to Full Call: 2 points.

Full Call to Full Call: 2 points.

Contacts in which a Radio Club is involved: 10 points.

CALLING PROCEDURE

Stations should call "CQ Novice Contest" on Phone or "CQN" on CW. Stations may be worked **only once per mode.**

EXCHANGES

Telephony stations should exchange (5) five digit numbers in order commencing with --001. The two numbers indicate signal strength and readability, e.g. 5 by 9 equals 59001. CW stations should exchange (6) six digit numbers in order commencing with ---001, e.g. 599001. Listener stations should log both the call sign and numbers in an exchange. Radio Club will add "C", e.g. 59023 **C.**

CONTEST CLASSES

Class A: Novice/Full Call Phone.
Class B: Novice/Full Call CW.
Class C: Novice/Full Call Open.
Class D: Listeners.

SUBMISSION OF CONTEST LOGS

Logs should contain details of: Station, time, band, mode, No. sent, No. read, points tally for section, together with this declaration: "I have operated my station in accordance with the licence requirements and the rules and spirit of the contest." This declaration should be signed and dated. A front cover for the contest log should contain: Name of operator and call sign, address, class for which entry is made, stations worked (a) Phone, (b) CW, points claimed (actual) and total points claimed.

Logs should be sent **Certified Mail** to: Contest Manager, Westlakes Amateur Radio Club, PO Box 1, Teralba 2284, by closing date of 15th January, 1978. Late entries may not be accepted.

The decision of the Contest Committee is final and no correspondence will be entered into regarding the Contest.

CONTEST AWARDS

Certificates for the highest score in each State will be awarded for the following:

Novice Phone, Novice CW, Novice Open.

Full Call Phone, Full Call CW, Full Call Open.

Radio Club Phone, Radio Cub CW, Radio Cub Open.

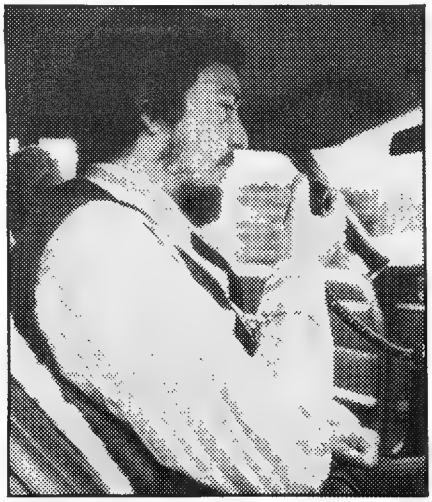
Listener Phone, Listener CW, Listener Open.

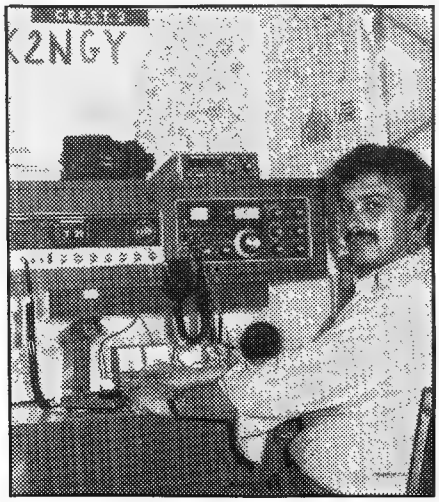
CERTIFICATES

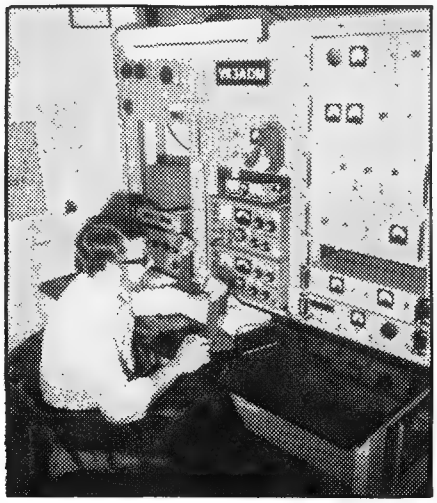
A miniature replica Certificate will also be issued to all stations and listeners who take part in the Contest indicating their participation. ■

AMATEUR RADIO ACTION

IS THE NEW GENERATION AMATEUR MAGAZINE







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CPU-2500R — 2 meter FM transceiver

Yaesu brings a Central Processing unit to VHF communications

Computer technology is brought to bear in the revolutionary CPU-2500R 2 meter FM transceiver from YAESU. Sophisticated circuit design and renowned YAESU quality workmanship are yours today with this exciting new transceiver from YAESU — where performance comes first!

Features

■ Heart of the CPU-2500R, a central processing unit (CPU), performs complex control operations while you just flick a switch.

■ 800 PLL synthesized channels are available in 5 kHz steps over the entire 2 meter band. A photo-interrupter frequency selection technique is used, and full 6 digit frequency display is provided.

■ The CPU scanner moves you instantly up or down the band, and will search for a busy or clear channel, as desired.

■ Four memory channels available for simplex or repeater operation, and additional memory channel may be used for split of up to 4 MHz. The CPU will scan just the four memory channels, if you wish.

■ Choice of standard microphone, with up/down scanner controls, or the keyboard microphone. The keyboard mike allows up/down scanner control, remote selection of dial or memory frequencies, and contains a two-tone encoder for autopatch or control purposes.

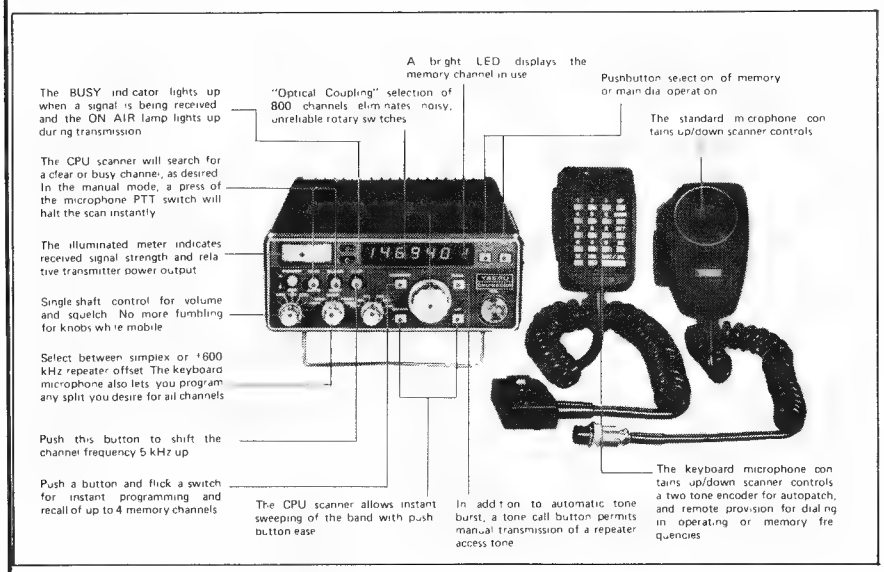
■ A subaudible tone guarded squelch encoder/decoder is an available option, for silent monitoring of busy channels.

■ A dual gate FET front end lets you pull in weak signals, while the transmitter puts out a solid 25 watts.

■ Convenience features include "busy channel" and "on the air" lamps, a memory backup feature, and manual or automatic tone burst selection. Your CPU-2500R is protected against high VSWR and reversed power supply polarity.

■ Ease of operation is ensured by careful selection of positions for controls and switches. Engineered for performance, using the latest technology, the CPU-2500R is truly a first-class set. YAESU promises you nothing less!

For a leaflet containing all specifications and full-color illustrations, contact Bail Electronic Services.


A bright LED displays the memory channel in use
The BUSY indicator lights up when a signal is being received and the ON AIR lamp lights up during transmission
"Optical Coupling" selection of 800 channels eliminates noisy, unreliable rotary switches
Pushbutton selection of memory or main dial operation
The standard microphone contains up/down scanner controls
The CPU scanner will search for a clear or busy channel, as desired In the manual mode, a press of the microphone PTT switch will halt the scan instantly
The illuminated meter indicates received signal strength and relative transmitter power output
Single shaft control for volume and squelch No more fumbling for knobs while mobile
Select between simplex or ±600 kHz repeater offset The keyboard microphone also lets you program any split you desire for all channels
Push this button to shift the channel frequency 5 kHz up
Push a button and flick a switch for instant programming and recall of up to 4 memory channels
The CPU scanner allows instant sweeping of the band with push button ease
In addition to automatic tone burst, a tone call button permits manual transmission of a repeater access tone
The keyboard microphone contains up/down scanner controls a two tone encoder for autopatch, and remote provision for dialing in operating or memory frequencies

CPU-2500R

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment.

Contact us for details of other Yaesu equipment plus the accessories required to complete your station.

All equipment from Bail's carries a 90-day warranty and complete service back-up.

Prices and specifications subject to change without notice.

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FRED BAIL VK3YS
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Radio amateur equipment from B.E.S. also sold by — JAS 7879-4

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TAS.	G. T. ELECTRONICS, 131 Westbury Rd., South Launceston 7200	Ph. 44 4773
	J. D. ELECTRONICS, 64 Wentworth St., Launceston 7250	Ph. 44 5000
	PRINS RADIO, 123 Argyle St., Hobart 7000	Ph. 34 6912
N.S.W.	Aviation Tooling, STEPHEN KUHL, 104 Robey St., Mascot 2020	Ph. 667 1650
	Amateur & Novice Comm. Supplies, W. E. BRODIE, 23 Dalray St., Seven Hills 2147	Ph. 624 2691
	DIGITRONICS, 186 Parry St., Newcastle West 2302	Ph. 69 2040
	RIVERCOM, Sid Ward, 9 Copland St., Wagga Wagga 2650	Ph. 21 2125
QLD.	H. C. BARLOW, 92 Charles St., Aitkenvale, Townsville 4814	Ph. 79 8179
	MITCHELL RADIO CO., 59 Albion Rd., Albion 4010	Ph. 57 6830
A.C.T.	QUICKTRONIC, Jim Bland, Shop 11, Altree Crt., Phillip 2606	Ph. 81 2824 82 2864

bail

DOES YOUR ANTENNA TURN IN THE WIND?

DOES YOUR CONTROL UNIT 'CUT-OUT' AFTER ONLY A FEW REVOLUTIONS?

. . . then step-up to a RELIABLE EMOTO ROTOR.

Bail Electronics are pleased to announce . . . . . an exciting range of ANTENNA ROTATORS by EMOTO ANTENNA Co. of Japan

EMOTO FEATURES
- **ROBUST DESIGN**
- **HEAVY DUTY STAINLESS HARDWARE**
- **100v. SUPPLY TO MOTOR REDUCES VOLTAGE/POWER-LOSS**

COMPARISON OF ROTOR BRAKE TORQUE FIGURES (kg./cm.)

CDE model	Torque
CD44	1,152
HAM-2	4,025
Emoto model	
103 LBX	1,500
502 CXX	4,000
1102 MXX	10,000

We have **been in the business** long enough to know your requirements for a first class antenna rotor, and we have gone "over-board" for the EMOTO range! There are many brands of antenna rotors, some of them completely unsuitable for the majority of amateur applications, and for this reason we do not stock them.

Most likely your present antenna rotor will turn your antenna and hold satisfactorily, but it just will not hold it stationary under strong wind conditions; i.e. YOUR ROTATOR LACKS SUFFICIENT BRAKE TORQUE, the ability to hold the antenna still whilst a gale is blowing.
HERE IS WHERE THE EMOTO SCORES.
Take a close look at the comparison figures above. Then compare the prices of all the rotors and you will have to agree that the EMOTO 103 LBX, EMOTO 502 CXX and EMOTO 1102 MXX are the best value.
Finally, EMOTO ANTENNA CO., is not a new company. They have been making rotors for many years. Have no fears about this being a new and untried product!

Universal® antenna couplers

Extremely important, especially with modern all-solid state transceivers, is the maintenance of a very low SWR to avoid destruction of costly high-power P.A. transistors. An antenna coupler enables precise adjustment with almost any antenna.

(S.W. or co-ax.)

HC 500A — 160-10m, up to 500w pep
(also available — not illustrated)
HC 2500 — 160-10m, up to 2.5kw pep
HC-75 — 80-10m, up to 75w pep
HC 250 — 80-10m, up to 200w pep
KW E-ZEE Match — 80-10m, up to 400w pep
FC 301 Yaesu — 160-10m, up to 500w pep

Now an addition to YAESU'S range of measuring instruments . . .

QTR-24

24 hour World Clock

QTR-24

Yaesu has now made an addition to their already well known range of measuring instruments, it is the QTR-24, a 24 hour World Clock. With a glance the time in any principal city or time zone can be simultaneously co-ordinated with local time on a 24 Hour basis. The QTR-24 is powered by a 1.5V dry cell, which has a normal life of approximately one year. No amateur or SWL station could be complete without one

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment.

Contact us for details of other Yaesu equipment plus the accessories required to complete your station.

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	WILLIS TRADING CO., 429 Murray Street, Perth 6000	Ph. 21 7609
S.A	FARMERS RADIO PTY. LTD., 20 Stanley St, Plympton 5038	Ph. 293 2155
TAS.	G. T. ELECTRONICS, 131 Westbury Rd, South Launceston 7200	Ph. 44 4773
	PRINS RADIO, 123 Argyle Street, Hobart 7000	Ph 34 6912
N S W.	Aviation Tooling, STEPHEN KUHL, 104 Robey St., Mascot 2020	Ph. 667 1650
	Amateur & Novice Comm Supplies, W. E. BRODIE, 23 Dalray Street, Seven Hills 2147	Ph 624 2691
	DIGITRONICS, 186 Parry St., Newcastle West 2302	Ph. 69 2040
	RIVERCOM, Sid Ward, 9 Copland St., Wagga Wagga 2650	Ph. 21 2125
QLD.	H. C. BARLOW, 92 Charles St., Aitkenvale, Townsville 4814	Ph 79 8179
	MITCHELL RADIO CO., 59 Albion Rd, Albion 4010	Ph. 57 6830
A C T.	QUICKTRONIC, Jim Bland, Shop 11, Altree Crt, Phillip 2606	Ph. 81 2824, 82 2864

EMONA electronics

Head Office, Sales & Service: 23 JUDGE ST., RANDWICK 2031. Ph. 398 6378
City Branch: ROOM 208/661 GEORGE ST., SYDNEY 2000. Ph. 212 4815
Cable Address: EMONA Sydney. A.H. CALL 398 6378

MAIL ORDERS: Box K21, Haymarket NSW, 2000, Australia
WRITE, PHONE OR CALL IN!

NEW!

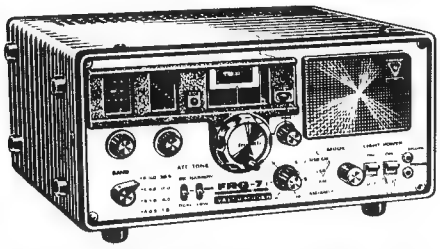
!AVAILABLE SHORTLY!

THE NEW DIGITAL H.F. TRANSCEIVER

DenTron DTR-1

NEW!

WRITE FOR FULL SPECS.

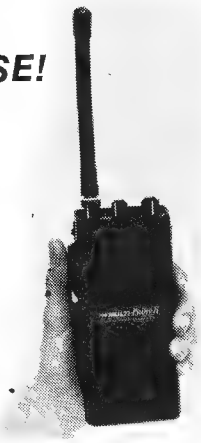


FRG-7 only $325

DR-48 only $466

FDK **MULTI Palm II** *NEW RELEASE!*

2m FM POCKET TRANSCEIVER



SPECIFICATIONS:

Transceive Frequency Range: 2 MHz in 144-148 MHz; Transceive Channels: 6 Channels; Mode of Operation: FM; Antenna Impedance: 50 Ohms unbalanced, BNC connector; Power Requirement: 12V DC (Negative Grounded); Power Consumption: Transmit 300 mA, Receive 100 mA, Stand-by 25 mA; Weight: 1.03 lbs. (470g); Repeater Offset: ± 600 kHz; Modulation: Variable Reactance phase modulation; Max. Deviation: ±5 kHz; Microphone: Condenser Microphone; Receiver: Double conversion superheterodyne (1st IF = 16.9 MHz, 2nd IF 455 kHz); Sensitivity: —4 dBu (NQ 20 dB); Audio Output: Maximum 0.3 Watts; Attachment: Rubber ducky antenna, Nicad battery pack, DC cable with cigarette lighter plug, Carrying strap.

$229

ALSO AVAILABLE:
- **MULTI 800D** **$416**
- **MULTI 2700** **$744**
- **BIGEAR TYPE 1** **$694**
- **BIGEAR TYPE** **$361**

New FULLY LEGAL ANTENNA ROTATOR

MEDIUM-SIZED HAM ANTENNA ROTATOR — FU 400.

With approved power supply	$139
Mast clamps	$11
Stay bearings	$32

Constructed for long trouble-free operation. 200 kg vertical weight capacity. Extra heavy duty disc brake that prevents wind-milling.

INQUIRE ABOUT OUR SPECIAL ANTENNA/ROTOR PACKAGE !!

ANTENNAS GALORE AT SPECIAL PRICES

AUSTRALIA'S LARGEST SELECTION OF BEAM ANTENNAS: 3, 4, 5 ELEMENT YAGIS, V-QUADS, Y-QUADS, etc.

Wilson — SY-1, 10-15-20m, 4 elem. Beam	$339
Wilson — SY-2, 10-15-20m, 3 elem. Beam	$279
Cushcraft — ATB-34, 10-15-20m, 3 elem. Beam	$289
Hustler — 4 BTV w/80m Resonator, Vert. Antenna	$130

SPECIAL COMMUNICATIONS SYSTEMS

RELAX AND ENJOY CW — Go RTTY Emona's Silent Way!

NEW INFO-TECH RTTY EQUIPMENT:

Model 75 RTTY to Video Converter	$448
Model 150 RTTY Keyboard	$407
NEW INFO-TECH MODEL 200!	$668

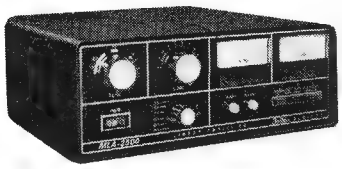
A complete system that converts Morse, RTTY and ASCII to Video, using Fairchild F-8 Microprocessor Technology! A good receiver and video monitor are all that is required!

NEW INFO-TECH MODEL 300! **$564**

A Microprocessor controlled, stand alone, keyboard that generates Morse, RTTY and ASCII codes.

ROBOT MODEL 400 SSTV CONVERTER **$898**

GREAT PRICE REDUCTION ! ! ! !



MLA-2500

DenTron Radio has packed all the features a linear amplifier should have into their new MLA-2500. Any Ham who works it can tell you the MLA-2500 really was built to make amateur radio more fun.

- ALC circuit to prevent overloading
- 160 thru 10 meters
- 1000 watts DC input on CW, RTTY or SSTV Continuous Duty
- Variable forced air cooling system
- Self-contained continuous duty power supply
- Two EIMAC 8875 external anode ceramic/metal triodes operating in grounded grid
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- Built-in RF wattmeter
- 117V or 234V AC 50-60 hz
- Third order distortion down at least 30 db

~~$1300~~ NOW **$1190**

LUNAR

HF3-100L2 Linear Amplifier	$245
Bi-Linear VHF Models	$259
28-432 MHz Low Noise Pre-amplifier	$42
In Line Switching 2m Pre-amplifier	$55
Oscar Box "J" Dual Freq., Oscar 8 Down Converter	$99.90

MIZUHO

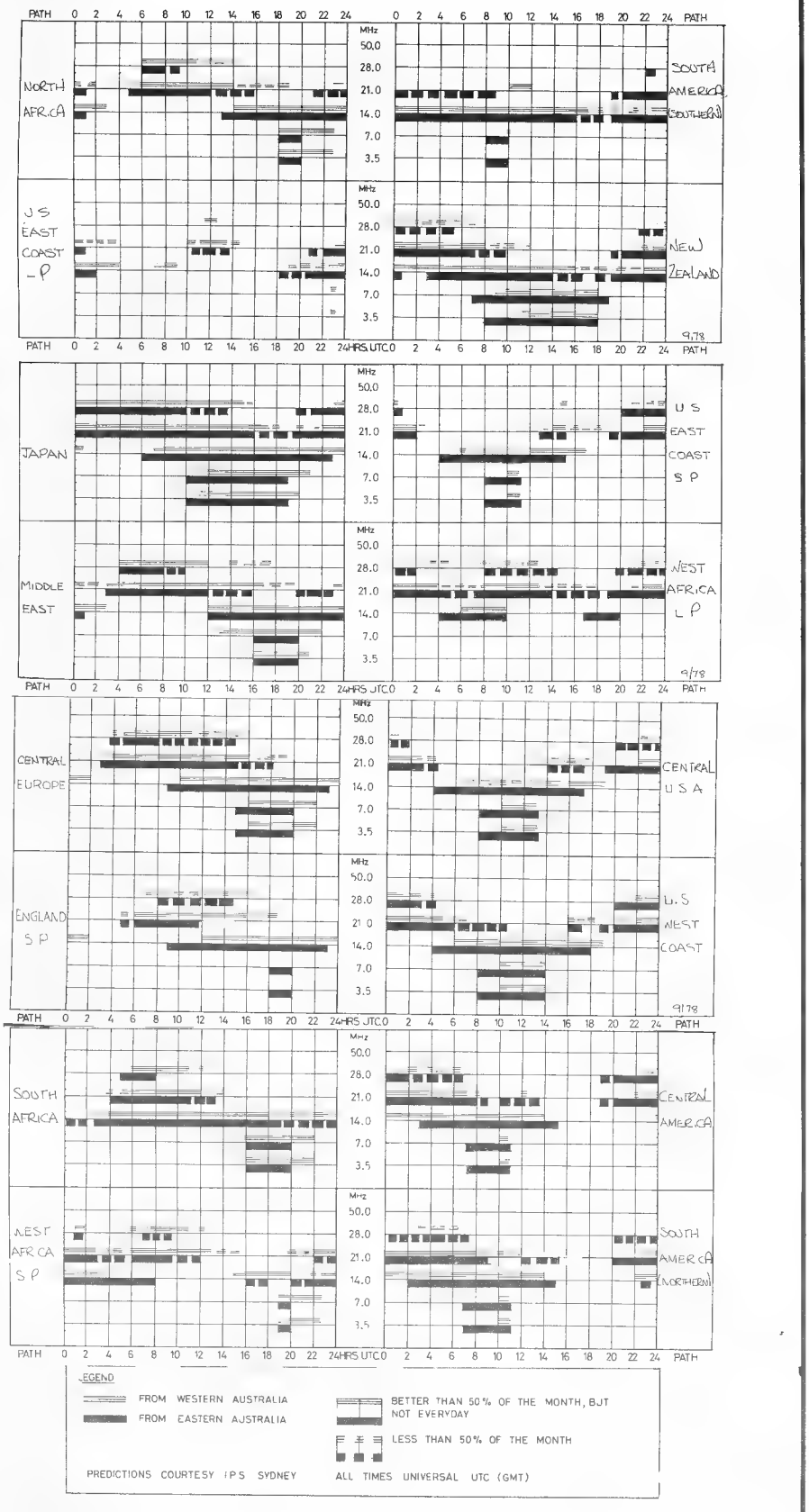
SX-59 RF Pre-amplifier	$84
SX-1 Pre-selector	$63
DX555P Counter Generator	
KX-1 Coupler	$56
MX-1D Marker	$69
Pre-scaler for DX-555P	$39

DENTRON ANTENNA TUNERS

MT-2000A	$269.50
MT-3000A	$447
160-10AT	$186
Jr. MONITOR	$104

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



QSP

VHF ACTIVITY IN THE USSR

The magazine "Radio" for April 1978 carries reports of VHF and UHF activity in the USSR.

On 144 MHz activity is high with some SSB signals. •DX is being worked using meteor scatter, aurora, and by tropospheric ducting. The following is a list of stations with their best distances worked. Many contacts being to other European countries.

Station	Best DX
UA3MBJ	200 km
UP2BBC	1989 km
UK3MAV	2520 km
UA3LBO	1500 km
UW3GU	1400 km
UA3PBY	875 km

On 432 MHz the list is smaller but good activity is reported using the same sorts of propagation as on 144 MHz.

Station	Best DX
UA3LBO	1360 km
UR2EQ	1160 km
UA2FCH	1125 km
UR2HD	1038 km
UP2BBC	890 km

On 1215 MHz a contact of 765 km is reported by UP2BBC to DL7YCA. The power used was 60 watts. A 1.2 metre dish was used as the antenna.

The station UP2BBC appears in all the listings and must be a keen VHF/UHF worker.

The notes in "Radio" are always full of doings and the VHF/UHF scene must be very active. ■

AUGUST 1978 AOCP EXAMINATION

The August AOCP examination caused many candidates to scratch their heads. Indeed many of the less well prepared candidates had a worried look.

P. and T. have managed to produce some new questions and re-worded others. Half the questions were new. A manoeuvre calculated to upset the parrots.

The exam paper is coming on to the target with questions slanted towards current usage. Full marks for putting some thought into it.

Finally, for those candidates still arguing about the answer to question 9 the correct answers are as follows:

(a) (i) 12 amps.
(ii) 720 watts.

(b) 10 ohms.

You didn't even need a calculator to work it out.

VK3AUI.

POSTAL AND TELECOMMUNICATIONS DEPARTMENT

AMATEUR OPERATORS' CERTIFICATE OF PROFICIENCY

August 1978

SECTION M (THEORY)

(Time Allowed — 2½ hours.)

NOTE: **SEVEN questions only** to be attempted. Credit will not be given for more than **SEVEN answers. All questions carry equal marks.**

1. (a) Describe, with the aid of a circuit diagram, the operation of the final output stage of a single-sideband type transmitter employing a pi-coupled tuning unit.
   (b) Describe how you would tune a transmitter using pi coupling, to correctly load a coaxial-cable coupled antenna.
2. (a) What do you understand by the "Piezo-electric effect"?
   (b) Explain, with the aid of a sketch, the construction and theory of operation of a crystal microphone.
3. (a) Aided by a sketch, show the RF voltage and current distribution on a transmission line when: (i) correctly terminated; (ii) terminated in a short circuit.
   (b) Explain the meaning of the terms: (i) standing-wave-ratio; (ii) current node.

4. Using circuit diagrams to illustrate your answer, explain the principles of simple and delayed automatic volume control in a superheterodyne receiver.

5. (a) With the aid of a sketch, describe the construction and theory of operation of a moving-coil permanent-magnet type of meter.
   (b) Describe where such a meter may be used and list any advantages and disadvantages associated with its use.

6. (a) With the aid of a diagram describe the operation of a circuit in which use is made of a Field-Effect-Transistor (FET).
   (b) What particular advantage has been attributed to the FET type?

7. (a) With the aid of a circuit diagram describe the theory of operation of a voltage regulated power supply in which a voltage regulating diode (zener) is used to obtain regulation.
   (b) Draw the forward and reverse current versus voltage curve for a typical zener diode and indicate the point on the curve where the "zener effect" commences.

8. (a) Explain the fundamental difference between frequency modulated and amplitude modulated signals.
   (b) With the aid of a circuit diagram, explain the theory of operation of the discriminator stage of a receiver capable of reception of frequency modulated signals.

9. (a) Three resistors R1, R2 and R3 of 20, 30 and 60 ohms respectively are connected in parallel across a 120 volt DC supply. Calculate:—
   (i) the total current drawn from the supply and
   (ii) the power dissipated by R1.
   (b) Show how an additional resistor R4 may be connected in the circuit described in (a) to reduce the voltage drop across R2 and R3 to 80 volts without affecting R1. Calculate the value of R4. ■

DIVISIONAL NOTES

Here are a few notes compiled from available sources.

Members might like to know that figures from the AR address labels control totals for September AR show how the WIA membership is expanding —

Division	Full members and pensioners/ life members	Total members
VK1	103	154
VK2	1280	1558
VK3	1233	1665
VK4	588	768
VK5	594	839
VK6	376	469
VK7	193	265
	4367	5718

Compare these with the statistics shown on page 34 of July AR, remembering that a number of the 137 students possess call signs, some Associates have call signs but have not yet notified the details, and a small number of financial members have no labels because their ARs had been returned to sender and no fresh addresses had been notified. Also the statistics in July AR included double call signs and family members, which are excluded from the control totals because no address labels are printed for those.

Altogether 1276 new members have joined the Institute so far this year.

VK1
Four new members for September AR, bringing the total for the year to 46. So far, only 14 previous members are still unfinancial.

VK2
At the July meeting 35 new members and 2 clubs were accepted into the Division. At the August meeting 45 new members were accepted. So far 51 previous members from last year have not renewed their membership. This highlights the effectiveness of the reminder system used by the Division.

REPEATERS
There are 12 repeaters operational in VK2 on 2m, one due to be operational late in 1978, two new ones under test, one more under construction and 4 projected. Applications are on hand for 2 ATV repeaters, one RTTY repeater, one 70 cm repeater and one 2m repeater. One repeater is planned for SSTV working. The VK2 September MB asks if anyone has had experience in modifying the Philips UHF CB unit for 70 cm use. Plans are in hand to establish a frequency and time standard 144 MHz beacon in the Upper North Shore area of Sydney. The State Repeater Committee are also looking into beacons for the 70 cm, 23 cm and 3 cm bands and suitable frequencies in the ranges 432.4 to 432.45 MHz, 1297.2 to 1297.29 MHz and "holes" available on 3 cm.

CONSTITUTION
The Division now has a new Constitution, which will become final after submission to the Corporate Affairs Commission.

VK3
69 new members began with September AR. However, a total of 173 failed to renew for the year.

As in the other States, Convention time is upon us. There are the Eastern Zone Convention at the Paynesville Country Club on 19th November and the Western Zone Convention at Ballarat on 4th-5th November (at Eureka Stockade on the 5th).

VK3
Coming event: November 4th and 5th, 1978 — Victorian Western Zone Convention. Details from Ballarat Amateur Group, K. Hughes, 14 Ophir Street, Sebastopol 3356. Ph. (053) 35 8135.

VK4
35 new members processed for September AR. However, 58 members from last year still remain unfinancial in spite of reminders having been despatched.

Conventions in Queensland include Queensland AR Convention in Brisbane, 16th-17th October, and the display at the Hobbies Exhibition from 13th-19th November.

VK5
An input of 67 new members for September AR. Only 41 failed to renew this year, thus justifying the expense and work done in sending out reminders to unfinancials.

VK6
A total of 17 new members inputted for September AR, but a total of 18 did not renew for 1978 despite reminders.

VK7
Seven new members this month but there were 11 dropouts for the year. Altogether 58 new members this year, which gives a good gain.

The Divisional Box Number remains as 1010, Launceston, but the Northern Branch now uses Box 275, Launceston.

The Tasmanian Divisional Bulletin has ceased publication. Divisional news will be incorporated in QRM.

The S. Branch 6m beacon frequency will be 52.457 MHz, hence the N. Branch beacon frequency will be shifted to 52.470 MHz.

The Tasmanian Convention will be in Hobart, 4th-5th November.

Short contributions by and from Divisions would be welcome.—Ed. ■

ALARA

AUSTRALIAN LADIES' AMATEUR RADIO ASSOCIATION

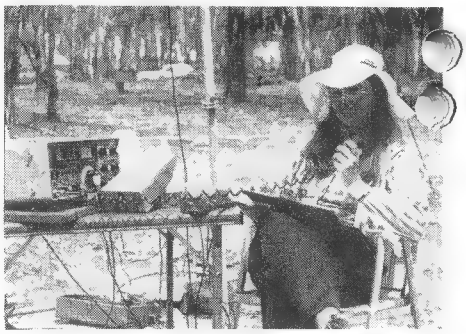
This month we proudly present Norma VK3AYL as the next star in our series of famous YLs. Norma will probably need very little introduction to VK3 operators and is well known in other States as well.

Norma was the guiding force behind the formation of the original LARA in 1975, and has put a great deal of time and energy into the organization ever since. As well as having been the Founding President, she continues the job of Secretary and Editor (author, typesetter, addresser, mailer and all-round producer) of the ALARA Newsletter. A thankless task, but I take the opportunity to put our thanks in writing at this stage.

ALARA's other arm of contact, the 80m Monday sked, also owes its existence largely to Norma's efforts, along with those of Myrna VK5YW (and, of course, the participants).

Norma hails from "Up North" (at least as far as the Murray) and takes off on periodic homeward excursions every now and then. She became interested in amateur radio at an early age and gained her licence without much trouble. She has since proceeded to gain a Science Degree at Melbourne University and a Dip.Ed.

Norma now lives in Melbourne where she is a teacher of maths and physics during the week and an enthusiastic amateur pilot in between times. (Such is her enthusiasm that Norma would probably say she is a pilot who teaches now and then.) Norma's teaching talents have been put to excellent use in amateur radio as she is the Novice Course Instructor at the Institute Tuesday night classes (with considerable success).



Norma VK3AYL in WICEN exercise.

All round, such a talented lady that this article has made it superfluous to include a planned article on ALARA activities — Norma has a hand in everything anyway. Altogether it would be true to recognize Norma as a very active YL who has made an outstanding contribution to amateur radio in general and to ALARA in particular.

33s,

Kate Duncan. ■

MAGAZINE INDEX

Syd Clark, VK3ASC

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RADIO ZS February 1978
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A Modular Control Unit — Just for Repeaters; Transmitter Design; VHF Coverage for Collins S/Line Receivers; A DoppleScAnt; Sunspots and the HW-16; An Audio Continuity Tester; OSCAR in the Classroom; Marconi Station Reborn on Cape Cod; CPR — It's a Lifesaver; Results, 44th ARRL November Sweepstakes; Rules, 1978 IARU Radiosport Championship; Parts Out, Hertz In; June VHF QSO Party; Field Day Rules; Field Day Came Early to New Mexico; Results, Frequency Measuring Test; The Fox Control Committee Boo-Boos; FCC Bans 10 Metre Amplifiers — Commissioner White Dissents in Part; Call Me Anything, but Don't Call Me "Good Buddy".

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BREAK-IN April 1978

The Importance of Making Experimental Records; Raincliff 1977; Annual Reports and Remits; Getting the Best Out of Your SSB; A Regulated Charger for 12V Motor Cycle Batteries; A Modification to the Wellington Direct Conversion Receiver; Modification to the Tuning Drive of the FRG7 Receiver.

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AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Crafers SA, 5152

WAVE

The Worked All VE Award (WAVE) is a long established award. Confirm two-way Amateur radio contacts in each of the eight VE call areas on 2 different bands for a total of 16 contacts. The same station may not be worked more than once, regardless of band. All contacts must be made from an area within a radius of 150 miles of one point. All contacts after 1-1-1939 count.

WACAN

The Worked All Canada Award (WACAN) is basically a continuation of the WAVE award, except that all nine provinces must be worked in addition to Newfoundland, Labrador and Yukon or Northwest Territories, for a total of 24 different stations. Newfoundland and Labrador contacts must have been made since 31-3-1949.

QSL cards are required unless you can provide a certified list from your club president, or a notary.

The fee for WAVE is $1 or 10 IRCs.

For WACAN, the fee is $2 or 20 IRCs.

An exception is for those who already hold WAVE and are applying for WACAN. The fee is then only $1 plus the additional eight QSL cards. Send your application, fee and cards to —

Nortown Amateur Radio Club, VE3NAR,
PO Box 146,
Station A,
Willowdale, Ontario, M2N5S8,
Canada.

(WRN)

For those who are trying for the **WAS** (ARRL), the following may be of assistance:

FIRST CALL AREA includes the States of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

SECOND CALL AREA includes the States of New Jersey and New York.

THIRD CALL AREA includes the States of Delaware, Maryland, Pennsylvania, and the District of Columbia.

FOURTH CALL AREA includes the States of Alabama, Florida, Georgia, Kentucky, North and South Carolina, Tennessee and Virginia.

FIFTH CALL AREA includes the States of Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma and Texas.

SIXTH CALL AREA includes the State of California.

SEVENTH CALL AREA includes the States of Arizona, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming.

EIGHTH CALL AREA includes the States of Michigan, Ohio and West Virginia.

NINTH CALL AREA includes the States of Illinois, Indiana and Wisconsin.

TENTH CALL AREA includes the States of Colorado, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota.

Other calls, including Hawaii and Alaska.

If any of you have information about, or rules of, awards which may or may not have been published in AR, please send it to the writer at the above address. With the large increase in the number of amateurs these days, the chances are that they will be unknown to the newcomers, and I have to fill this column somehow! ■

IARU NEWS

The Republic of Djibouti has been recently admitted as the 154th member country of the ITU.

The Grenada ARC and the Assoc. des Radio-Amateurs du Senegal were elected to membership of the IARU. The total is now 101.

On 6th October the 4th triennial conference of the IARU Region 3 Association will open in Bangkok. IARU HQs will be represented by the IARU President, Noel Eaton VE3CJ and the IARU Secretary, Dick Baldwin W1RU. The WIA will be represented by the Federal President, David Wardlaw VK3ADW, and the Exec. Vice-Chairman, Peter Wolfenden VK3ZPA. The Secretary of the IARU R3 Assoc. is David Rankin VK3QV/9V1RH. Also attending will be Michael Owen VK3KI, one of the four Directors of the Association.

This will be the last occasion for Region 3 amateur societies to meet together prior to WARC 79.

The 8th SEANET Convention will be held in the Marco Polo Hotel in Singapore from 10th to 12th November. Details from the hosts, Singapore AR Tx Society, Box 2728, Singapore 1, or by joining in the SEANET held daily at 12.00Z on 14320 kHz.

During October/November David Wardlaw and Michael Owen will be attending the CCIR Special Preparatory Meeting in Geneva. This is a most important event designed to finalise, as far as possible, the technical material for WARC 79. The amateur service should be the subject of discussions if the recommendations by the CCIR international study groups are adopted that the service should come within the terms of reference of CCIR Study Group 8. At present the Amateur Satellite Service is considered by Study Group 2. ■

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

Diawa RF550 AC/DC RF Processor, 6 dB gain, crystal filtered, new, $130; also Kraco 23 ch. CB Tcvr, suitable for 10m conversion (ref. August AR) or 80m transverter, completely aligned and tuned, complete with mike and mobile mount, etc., excellent condition, $75. Kevin Cocks VK3NPC. Ph. (051) 57 1492 A.H., (051) 52 4632 Bus.

Drake SSR-1 Comm. Rx, as new, in original package, $240; Lafayette HA 63A comm. Rx, 0.5 x 30 MHz, band-spread, needs alignment, all new tubes, $50. VK2ZFN. Ph. (02) 560 9415 Bus.

Yaesu FT101E, few months old, as new in box, $745. Ph. (03) 467 3223 A.H.

Trio JR60 Rx, factory fitted band-spread with 2m converter, and FM det., $100; 6m and 2m converters, $20 each; 23 and 40 ch. 11m rigs converted and operational on 10m, base and mobile. Ring or write for details. Gavan VK3ZNC/VK3NIC, QTHR. Ph. (051) 47-2368.

SSTV Fast/Slow Digital Converter, W6MXV 200 with ¼, ½, full frame selection, grey scale generator, video invert, 14 grey shade capability, $150. Stan VK3BHZ, QTHR. Ph. (060) 71 7244.

Pye CD-1 Stereo Cassette Deck, twin VU, bias shift, chrome/normal select, pause, DIN, etc., very little use, surplus, $120, negotiable; circuit and instructions. VK1GB, Box 789 Canberra City 2601. Ph. (062) 47 3296 or 54 1985.

FT75B, with AC and DC power supplies, external VFO, hand book, excellent order, $400. VK2BDT, QTHR. Ph. (048) 21 5036.

Icom 502 6m hand-held DC or AC operated transceiver, converted, $160; FT2 auto 2m AC-DC FM transceiver with xtals, Simplex 40-50-51 repeater, R2-R8 R44 and reverse repeater R44. with mike and cables, $175, ONO; 3 new QQEO3/12 valves, 1 only QQEO3/20 valve, new, never used, offers. VK4AGO, QTHR. Ph. (071) 72 4101.

Yaesu FT75B 100W HF Tcvr, with AC and DC power supplies, 9 xtl freqs, external VOX unit, speech processor and mobile bracket, complete station, $550; Ken KP202 2m FM R2, R8, 40, 50, with nicads and charger, with 2 antennae, $160. Jim Hendrickson. Ph. (059) 624 1666 Bus.

Icom IC-22 FM Trx (CTC B12-12 final), mobile mount and manual, Ch. RPT-2, 3, 4, 5, 6, 7, 8, Anti. 2, 4, Simp. 40, 50, $160; Pye 8750 50W FM base, Ch. 40, 52, pre-amp, $60, ONO; Pye FM Ranger mobile and bracket, ch. 40 and R3 and mains PSU, $25; AR-2 five-eighth wave 2m Ringo, $25; Swan 175 (conv. to 20, 40, 80) and PSU, $100; Command sets (3), BC-455B, 454B, 453B, RX and rack, $30; 7 ft. x 17 in. rack cabinet, $20; "NDB" cabinet, $20. Assorted chassis. VK2YBW, QTHR. Ph. (069) 21 2238.

Yaesu FRG7 Receiver, perfect condition, $280, ONO. Alan VK3NQD. Ph. (03) 314 0344 Bus., (03) 398 4853 A.H.

Collins 75S-1 Hamband Rx, excellent condition, 80-10m, with 110-240V transformer and some spare tubes for the Rx, $360. Phill Jury, L30530. Ph. (03) 560 9215.

New 23 Ch. AM/SSB Transceiver, converted to 10m, 4 ch. fitted (21, 22, 22A, 23) as per band plan, $89. VK7FT, QTHR. Ph. (002) 44 4321 A.H.

Astro 200 Txcr, mint cond., $650; Swan MB40A solid state 40m transceiver, 100W PEP, unused, $250; Kenwood TR2200A, rep. 1 to 8, 40 and 50, nicad batteries and charger, as new, $200; Dentron super tuner, 1 kW, built-in balun, $200. VK2BHF, QTHR. Ph. (02) 98 6249.

Yaesu FT-7 HF Mobile Transceiver, complete, unmarked and genuinely new, with manual, leads and unused accessory plugs, mike, $500. VK2PT, QTHR. Ph. (049) 43 1308.

Linear Amplifier Heathkit HA14 with HP24 AC power supply, 1000W PEP, 10/80m, $400. VK3BCY, QTHR. Ph. (03) 848 4775.

Drake T4XC Tx, SSB/CW, 160-11-10m with Drake AC-4 PSU, Drake R4C Rx with noise blanker and 14 accessory 500 kHz freqs. included, Drake base station, Dynamic mic., Drake W4 wattmeter, brand new in factory cartons, $1,795 complete. VK2JO, PO Box 505, Bondi Junction 2022, NSW. Ph. (02) 36 7756.

Hallicrafters FPM-300 250 watt PEP input, SSB/CW HF 80-11-10m solid state HF Txcvr, 240V and 12V DC PSU built in. complete with deluxe 12V DC mobile mount and Dynamic mic., similar to FT101EE, but made in USA, excellent condition, Hallicrafters owner's manual included, $495. VK2JO, UO Box 505, Bondi Junction 2022, NSW. Ph. (02) 36 7756.

Transceiver, Plessey PTR170, 220 to 400 MHz, 12 ch., 28V DC, hybrid, excellent cond., $75; Hidaka VS2GH 2m 5/8 ground plane in original packing, unused, $35; Volstat constant voltage transformer and heavy duty bridge rectifier, 16.5A at 38V DC (trans. sec. could be tapped), $60. VK3BFB, QTHR. Ph. (03) 93 1638.

Communications Rx, 150 kHz to 30 MHz, 5 bands Lafayette HA600A, as new cond., perfect working order, FM det added, $100; 4-500 52 MHz valve SSB linear 400W PEP out for about 10W drive, $120. VK4ZNC, QTHR. Ph. (07) 205 2121.

Yaesu FTDX 401 HF Transceiver with matching speaker, mic, low pass filter, Katsumi mic, compressor model MC-22S, all with English manuals, package deal, $450. VK3PH, QTHR. Ph. (053) 30 1466.

48 ft. Self-supporting Tower, 12 in. x 18 in. tri. sections, built-in ladder, plus 20 ft. length high tensile pipe, suit hvy beam or Christmas tree array, commercial mfg., exc. cond., $300; Collins calibrated stainless steel portable multi-dipole 637T, all freq., mint cond., $130. VK2AAK, Box 954, Parramatta. Ph. (02) 635 1320.

GDO UHF Megacycle Meter, 420-940 MHz; by Measurements Ltd., with power supply, $100; Collins 312B5 external VFO, wattmeter, phone patch, speaker, control unit, $450. VK2AAK, Box 954, Parramatta. Ph. (02) 635 1320.

CQ Magazines 1960-69, almost complete, several years "73", 25 cents each; assorted text books on elect. engineering, agriculture, flying, etc., from $1 each; bound set G.E. Reviews, 28 vol., 1922-1950, exc. cond., collector's item, $1.50 each. VK2AAK, Box 954, Parramatta. Ph. (02) 635 1320.

Kenwood TS520 with DC power supply and CW filter, complete with handbook and original packing, $575. VK3KK, QTHR. Ph. (03) 469 4200, after 6 p.m.

Trio TR2E 2m AM Transceiver, good cond., with manual, triple conversion, dual VFO, 240V AC, 12V DC, $100, ONO. VK2AHE, QHTR. Ph. (049) 2 4213.

Swan 350 and 230XC power supply, in perfect working order, recently overhauled and line-up done, $295, plus freight. VK4ABS, QTHR. Ph. (07) 351 3298.

FRG7, six months old, $275; Realistic SX190, VGC, $125. Will deliver to Melb. Dave. Ph. (03) 743 6992.

WANTED

Hammarlund Super Pro Rx Primary Aerial Coil, 200-400 kHz (result of lightning strike) and matching AC PSU, will consider wrecked chassis for spares; CQ magazines from about 1950 onward; Hallicrafters Rx S and SX series (WW2 models), HF and VHF. VK3AQB, QTHR. Ph. (03) 337 4902.

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It is with deep regret that we record the passing of —

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Mr. R. H. HILDER	**VK2AFT**

Viewfinder Camera, Sanyo VCM 2000A or similar. Stan VK3BHZ, QTHR. Ph. (060) 71 7244.

Capacitors from AT5 or TU Tuning Units, Command Tx, etc.; also carrying case for Ken KP 202. VK3AHG, QTHR. Ph. (03) 288 2024.

VFO in good condition, and also extra crystals required for FT-75B. Details to H. V. Lonsdale, 2 Balfour Street, Newborough, Vic. 3825.

Tower and 3 Band Quad or Yagi. Price, etc., to VK3YBR, QTHR. Ph. (03) 795 2792.

Johnson Matchbox or KW EZY match antenna tuning unit with facility for balanced twin feed and coax. feeders. VK4ABS, QTHR. Ph. (07) 351 3298.

EVENTS

Capricornia Amateur Radio Festival. Conducted by the WIA Central Queensland Branch. Interests for everyone. Date: 16th-17th September. Place: Rockhampton. Details: Write Sec., Box 496, Rockhampton 4700.

STOLEN

Stolen from TAA Flight Section Newcastle NSW, my Yaesu FT101B, serial No. 10033934, on Sunday, 24th May, mint condition, no alterations, packed in original carton, with mic. and accessories. VK4UR, QTHR.

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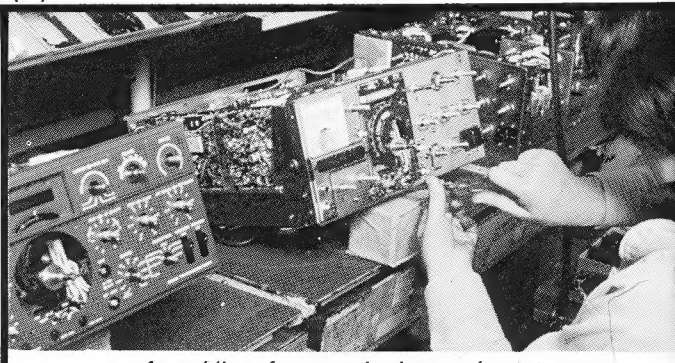

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